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CONSTITUTION AND CHARACTEROLOGY[1]

(CYCLOIDS AND SCHIZOIDS)

From the cab-driver, who sizes up his customers to be "sure of his shilling," to the physician and the artist, who study face and figure from a higher specific viewpoint, the estimation of the appearance of the individual with reference to his ultimate character has ever been a matter of intense human interest. The knowledge most prized by men of the world is knowledge of human nature. "The proper study of mankind is man." The "characters" of Theophrastus, of La Bruyère, of Dickens, all imply a keen *flair* for human oddity. Even the empirical data of physiognomy (Lavater) and phrenology (Gall), as set forth in the ludicrous woodcuts of popular treatises, have merged of late years into physiological concepts which are "scientific" as far as they confer actual power of prediction. There have been great physicians of the past, such as Corvisart, Skoda, Hebra, Joseph Bell, Da Costa, who could usually ticket off the occupations as well as the diseases of their patients at a glance. One of the oldest of these visualizations, the Hippocratic picture of the phthisical habit of body, is cited in Osler's *Practice*. How carefully such details were noted by the elder physicians is well illustrated in Dr. Richard Bright's lecture to his students of 1832:

"By the eye you will learn much; many diseases have the most distinct physiognomy. The sunk and shrivelled features derived from the long-continued disease of the abdominal viscera, the white and bloated countenance often attendant on changes in the functions or structure of the kidney,

[1] Ernst Kretschmer: Physique and Character. Transl. by A. J. H. Spratt. London, 1925.

the sallow and puffy cheeks of the liver diseased from habitual intemperance, the squalid and mottled complexion of the cachexia dependent upon the united effects of mercury and syphilis, the pallid face of hæmorrhage, the waxen hue of amenorrhœa, the dingy whiteness of malignant disease, the vacant lassitude of fever, the purple cheek of pneumonia, the bright flush of phthisis, the contracted features and corrugated brow of tetanus—all these shades of countenance, and very many more which I might enumerate, with all their varieties of combination, are distinctly recognized by the experienced eye."

The modern doctrine of the constitution derives in the main from four sets of data, *viz.*, those of photography, anthropometry, endocrinology and psychiatry. The 28 volumes of Charcot's *Iconographie* of the Salpêtrière afford the best examples of the first. The anthropometric phase is well illustrated in Professor Draper's book on *Human Constitution* (1924). The endocrine aspects have become familiar through the well-known treatises of Cushing, Biedl, Falta and others. It is the psychiatrist, however, who has done most to establish certain norms of congenital physical constitution as indices of types of character (mentality), sometimes tending toward the morbid. In 1912, Chaillou and MacAuliffe proposed a classification of male individuals for military purposes, comprising the muscular or athletic, the digestive or well-nourished, the respiratory or full-chested (singers, orators, runners) and the cerebral or nervous. Apart from athletes and intellectuals, it was found that this arrangement is as empirical as the old doctrine of the sanguine, bilious, lymphatic and nervous temperaments. In all these arrangements, as in the highly popularized characterology of endocrine disorders, the specific traits usually coexist or overlap in most individuals. A loud voice and a chesty manner as well as gluttony, for instance, are often noticeable in weazened individuals of diminutive size, and Emerson's people with eyes like bullets, or who bark like dogs or neigh like horses, are referable to no particular physical conformation. From the data of psychiatry, with accurate measurements as controls, Kretschmer has made a much more effective, if empirical, arrangement, *viz.*, the athletes, the pyknic or well-nourished people, the leptosomic or asthenic people, and the dysplastics (victims of endocrine or other dysplasias). Applying this classification to Kraepelin's grouping of the psychoses as manic-depressive

insanity (cyclothymia) and dementia praecox (schizophrenia), Kretschmer found that two-thirds of manic-depressive cases are of the fat-faced, ruddy, soft-bodied or pyknic type while the schizophrenic cases are one-half of them pale asthenics, one-fourth athletes[2] and one-fourth dysplastics (Adler's inferiority complex). We have here, then, apparently a definite correlation between constitution (facies and habitus) and mentality. The line of demarcation is nowise rigid, since by crossing of hereditary traits, a schizoid mentality may coexist with a pyknic physique or *vice versa*. In women, the physical characteristics are less sharply defined. It is obvious, too, that racial and social affiliations, harsh parentage, narrowing occupations or other environmental phases, may superinduce transient or permanent praecox traits, although the constitutional basis of character remains unaltered. The merit of Kretschmer's classification is that it signalizes certain basic types of physique and facies as points of departure, from which mental peculiarities, sometimes tending to the pathological, are predictable.[3] On the other hand, such types of habitus as the phthisical, arthritic, hemolytic, cardiorenal or Parkinsonian, apply only to circumscribed clinical categories, sometimes dependent upon an accidental local lesion. If it be true that athletes, asthenics and victims of endocrine disorders tend to the cloven Faust-like personality or the childish, shut-in mentality, while the fat-faced, well-nourished pyknics tend to alternations of hypomania and depression, then we have indeed a new clew to character. The pyknics, or people of "cycloid" mentality, are the full-faced, ruddy, well-nourished, soft-bodied people who make up the bulk of humanity, the sociable, friendly, good-natured people who take life as it comes, take jokes without bearing malice, make mischief without apparent intention, who are saddened rather than nervous or worried under misfortune (the "wounded ani-

[2] Athletes, male and female, are sometimes dysgenital, with undeveloped mentality. The upstage autism of professional pugilists and cowboys, as lovers or husbands, is cleverly indicated in Bernard Shaw's *Cashel Byron* and Mrs. Rinehart's *Tom McNair* ("Lost Ecstasy").

[3] It is obvious that Kretschmer's arrangement is simpler and truer to ordinary human nature than Jaensch's somewhat abstruse notion of tetanoid (cerebro-spinal) and Basedowoid (vegetative) types.

mal'' reaction) and are usually temperamental rather than mental. They are ordinarily the cheerful, tough-minded organizers, go-getters, whole-hoggers, Big Boys, Babbitts and Pashas of the business world, as well as its bakers, butchers and innkeepers; in science, the observers, recorders and empiries, in literature and art, the realists and humorists. This type connotes the *sang généreux* of the moon-faced peasant, the broad faces of the Slav, the Finn, the Mongol, the Negro, and corresponds very closely with the digestive type of Chaillou and MacAuliffe. When bald-headed, the cycloid types are bald all over. They are particularly exposed to arteriosclerosis, gout and rheumatism, goitre, obesity, diabetes and other disorders of metabolism. The schizoids,[4] on the other hand, are the sharp-featured, thin-bodied, thin-blooded, pale or sallow people, predominantly of mental or nervous type, whose hair tends to grow down the back and whose baldness, where existent, is in patches. They may range in character from the supersensitive idealist of fine feelings (''mimosa type'') to the narrow-minded tyrant or cold-blooded criminal, the past-masters of coxcombry or the dry, dull-witted, insipid specimens of affective lameness or psychic blindness. The schizoid group includes the long-haired, spectacled idealists, the ethical and social reformers, the mad monarchs and fanatics of worldly affairs; in science the systematists and theorists; in art and literature the sickly-sentimental romantics as well as the devotees of ''classicism'' and formal perfection. This group implies such cold-blooded types as the dry pedant, the male shrew and he-old-lady, the supercilious snob and pseudo-aristocrat, the empty-headed social marionette, the miser, the sneak, the intriguer, the double dealer, the smart Aleck, Carlyle's rabid ''have-not,'' the dragon or dragoon of virtue and categorical imperative, the blackmailer, the professional calumniator, the meddlesome *Naseweis,* the spiteful *Spitzbube,* and the

[4] It has been noted that if the words schizophrene, schizothyme and schizoid had been properly constructed from the Greek roots, they would be schismophrenia, etc., or schistophrenia, etc., as in other medical terms derived from these roots, thus conveying the idea of a schism or schist in the mentality and personality of the individual. The temperament is either the *anima anceps,* the house divided against itself, or the Ishmaelite, at war with his kind and the world at large.

public nuisance generally. At the bottom of all this extraordinary variety of human character lies autism, the inscrutable shut-in or undeveloped mentality, with its implications of frustrated sexuality, childish hatred and hostility to the world (the praecox complex). Schizoid characters of this kind are particularly liable to neuroses from basic sexual dysharmony. Kretschmer notes that the devil of tradition and the pale, lanky saint are both of schizoid type. The motto of his book expresses Caesar's preference for the "sleek-headed men and such as sleep o' nights" to the "lean and hungry kind":

> "He thinks too much: such men are dangerous."

We may note, in passing, that the effect of environment in producing autism is also indicated in certain lines of Shakespeare:

> "Home-keeping youth have ever home-bred wits:
> He cannot ever be a perfect man,
> Not being tried and tempted in the world."

and of Goethe:

> "Es bildet ein Talent sich in der Stille,
> Sich ein Charakter in dem Strom der Welt."

Examples of cycloid types are in worldly affairs, Mirabeau, Luther, Bismarck and the heavy-jowled politicians of the 18th century; in science, Humboldt, Darwin, Huxley; in art and letters, Rembrandt, Schumann, Goethe. Examples of schizoid types are such religious leaders as Savonarola or Calvin; such philosophers as Spinoza, Kant, Locke, Stuart Mill; such artists and men of letters as Michael Angelo, Wagner, Pope, Schiller. Kretschmer notes very acutely that, in old times, scholars, scientists and philosophers were of predominantly schizoid type, while to-day the type is overwhelmingly cycloid. The explanation is simple, namely, that occupations which imply trained capacity for intensive reasoning now play an important, rewarding part in the larger life of the world and are consequently followed by men who might otherwise have been warriors, bankers and captains of industry. Great soldiers like Caesar, Frederick and Napoleon are, in Kretschmer's view, remarkable mixtures of cycloid and schizoid traits. Conflict between an isolated mentality and a hos-

tile environment may induce the psychic equivalents of lysophrenia, merging into schizophrenia.

Coming to deviations from the normal, the cyclothymic and schizophrenic misfits are usually, in the Germanic phrase, "eats that walk by themselves." Of the relative harmlessness of the manic-depressives, Kretschmer gives some exquisite examples, *e.g.*, the gay, perpetual chatterbox, whose loud laugh and incessant florid speeches are heard from afar off; or Quick, the breezy, reckless, successful, eternally loquacious business man of loud style and dubious tastes, who, on his mother-in-law's birthday, invades her bed-room at 2 A. M. to present her two sacks of meal and an oil-painting, while, in the street below, a brass-band discourses hymns (*"Das ist der Tag des Herrn"*) and potpourris from 6 A. M. to nightfall. Quick himself eventually makes a speech from his balcony to the assembled populace. Committed to an asylum, he is charming, quiet, reasonable, amusing himself with such toys of his invention as brushes and rolls of toilet-paper that play tunes. The ladies (wife and mother-in-law) meanwhile are found "lying on their beds, suffering from nervous prostration" —always the best defensive reaction in such cases. With sundry Americans, a man of this kind might be mistaken for a very redoubtable humorist. An example of the uncertain mental tendencies of schizophrenes would be a servant-maid, pious and otherwise meek as a lamb, who suddenly murders the three children entrusted to her care. It is obvious, as Kretschmer points out, that there is no absolute clinical relation between physique and psyche, since indefinite combinations, such as pyknic physique and schizoid psyche, or *vice versa*, are producible as crosses by marriage between the fat and good-natured and the lean, wiry and nervous (Carlyle's "circle and its tangent"). As stated, a shut-in environment, *e.g.*, that of narrow, exclusive, ingrown family or social (occupational) relations, may produce an autistic mentality. Thus the composer Beethoven, before the advent of his deafness, was of the attractive, sociable, broad-faced pyknic type, as evidenced by such *plein air* music as his earlier symphonies or the *Septet*. Stone-deaf he became autistic. From the *Eroica* onward, his later music usually expresses the idea of a lonely soul contending with adverse fate. His last quartets and piano sonatas are, in Richard Wagner's phrase, "a voice from

another world," sometimes unintelligible and almost unplayable. Yet all his life, Beethoven, like most pyknics, was a first-rate business man. Again, Kretschmer's theory seems vitiated to some extent by the vagaries of ethnic psychology.[5] The clock-faced Mongolian, for instance, is usually amiable, sociable and the reverse of autistic; yet his mental processes, as with most Orientals, remain inscrutable. The view of Nordics as schizoid, of Alpines as cycloid, has some fallacies. With these reservations, however, we may accept Kretschmer's view that while physique and psyche connote nothing absolute about each other, physical habitus, facies, mentality and hereditary tendency to disease are really the basic elements of the constitution of the individual with reference to the development of his character, in other words, his reactions to environment. The modern *plein air* education of children is significant as a reaction against the domestic autisms of the past. Formerly the psychiatrist studied only diseases of the brain. Now he studies the effect of endocrine and other chemical phases of the constitution upon the workings of the mind.

F. H. GARRISON

SYMPOSIUM: THE EVOLUTION OF MIND

THE BRAIN OF PREHISTORIC MAN

FREDERICK TILNEY

(Delivered before The New York Academy of Medicine, April 7, 1927.)

I feel very reluctant to speak here this evening, especially in the presence of the greatest living authority on all matters prehistoric, but inasmuch as it was Professor Osborn himself who requested me to make this study of the brain I shall depend on his indulgence and goodness to correct any discrepancies I may make.

It is evident from listening to the staggering figures you have just heard about the antiquity of man that the most conservative

[5] For a brilliant exposition of this phase, see L. F. Clauss: *Rasse und Seele*, Munich, 1926.

estimate places the origin of our race back about 500,000 years. Professor Osborn has taken the dawn of mankind back four million years, and Sir Arthur Keith in his famous work on the "Antiquity of Man" triples this figure when he says that there is nothing known to him which would prevent the appearance of human form in the Miocene. This estimate takes the time of human origin back fifteen million years.

During all this vast era of geological time, this almost incomprehensible era, with its many changes in climate, its recurrent glaciations and long periods of warmth between, man's brain steadily grew. At first this growth was very slow and hesitating: later it became so decisive as to make cerebral development one of the most conspicuous, if not the most conspicuous, feature in human evolution.

From his earliest beginning man's brain has not only grown in volume, but it has acquired much refinement in many of its structural details. Its newer parts especially have become more highly specialized until finally the brain of modern man is a far more efficient organ than that possessed by any of our prehistoric human antecedents. It is probable that a large number and variety of prehistoric men have inhabited the earth at different times. Several different races of these people have already been identified by the means of fossilized human bones. The racial characters and the racial differences established in this manner have been utilized to reconstruct, in so far as possible, some assemblance of the outward appearance of these prehistoric peoples who have long ago departed. In the reconstruction by Professor MacGregor, of Columbia, the differences between these various people is most striking.

The Simian appearance of the Pithecanthropus-erectus affords good reasons for calling this earliest known member of our family circle the *ape-man*. The old man of Cro-magnon has a noble countenance which entitled him by itself to be called, as he has been called, the Paleolithic Greek. Between these two extremes the Piltdown man and the Neanderthal man are obviously intermediate stages. How these very ancient people thought and felt and lived is a matter of extreme importance to the fullest understanding of human nature; what the brain has to reveal concerning these matters is still more significant in relation to the cul-

tural possibilities of humanity. It offers an opportunity to study the psychologic foundations of human progress. In the light of contemporaneous exploits and advancements, in the light of history, it is essential to assume the existence of some specific power which distinguishes man among all living things. If we could visualize him toiling upward over his long way, through all this great number of years, we would see him beginning at his lowest level, perhaps four million years or more ago, as Pithecanthropus and then ascending successively as Heidelberg, Piltdown, and Neanderthal man. Finally, as Cro-magnon, he reaches the high plateau from which he looks out upon the world for the first time as *homo sapiens*. During all this long and laborious ascent, through all this long time he has gradually been acquiring the distinctive human power which has been called by so many names—that surpassing endowment which Professor Osborn believes came to him at last when he stood up in the dawn of his Cro-magnon manhood and drew upon the walls of his cave the first imperishable record of his greatness.

The acquisition of this great human power is the story which the prehistoric brain has to tell. It is not known in all its aspects or all its phases, but some of it seems clear. In order to get any idea of what the prehistoric brain was like, it is necessary to depend upon certain circumstantial evidence. This admission may seem to put the case in its most unfavorable light at the outset, but the fact remains that the brain of man like other soft parts of his body disappeared. It has not disappeared, however, entirely, because it has left certain impressions upon fossilized bones of the cranium which have been discovered and traced back to the oldest known races of man. Of course, there is some question as to the value to be attributed to these impressions on fossilized bones. Professor Symington, who has studied the subject most extensively by means of endocranial casts, is extremely cautious in the matter. He prefers to acknowledge the limit of our understanding at present and not to draw too extensive conclusions. Still, notwithstanding this caution, there are certain impressions and certain ridges on these fossilized bones of the skull which must be accepted as landmarks of utmost importance in determining brain areas of functional localization.

The first or lowest of the human family is the Pithecanthropus-erectus. An antiquity of at least 500,000 years has been at-

tributed to it. Probably this is far too small a calculation. A good many authorities have questioned the humanity of this particular species. But the brain of the Pithecanthropus (the ape-man) indicates a primate standing high in the scale, certainly above the great anthropoids. I think the size and the shape of the brain entitle this particular species to be classed in the human family. The brain is small, to be sure. It measures only 940 c.c., according to the latest estimates. But it possesses something that none of the great apes has, that is, pronounced development in the frontal region. It also has a marked arch in that upper vertical area which indicates developments of the highest importance to humanity.

I have endeavored on this endocranial cast to work out localization and put in two of the main fissures, *i.e.*, the fissure of Rolando and the fissure of Sylvius. Rolando separates the parietal and frontal lobes. One very striking feature about this brain of the earliest human form is the region known as Broca's area or the motor speech area. It is evident that this particular human had added one supreme equipment to motor his activity. He was able to speak. He had acquired the ability to impart ideas and feelings by means of spoken language. He had thus laid the foundations of human knowledge. In measurements of this brain it is apparent that the left hemisphere is larger than the right, indicating undoubtedly that the individual had acquired unidexterity, that is, he had become righthanded. In all probability this righthandedness was due to the fact of his manual manipulations in the production of tools.

The next step forward in humanity is that seen in the Piltdown brain. This race of Dawn Men had an antiquity variously estimated at from 400,000 to 3,000,000 years. The first report on this fossil was made in 1912 by Dr. Smith Woodward before the London Geological Society. It created a great stir among scientists because it was believed that the missing link long sought by the followers of Darwin had at length been brought to light. But whether this was really the missing link or not it is certain that it told of a race of men who inhabited England long before Caesar's invasion, in fact, ages before the ancient Britains had inhabited the land.

The advances which are shown in the Piltdown brain are those also in relation to speech and manual differentiation. The locali-

zation established by means of introducing the fissure of Rolando and the fissure of Sylvius shows a pronounced advance in the development of the speech area, also in the auditory area, which is essential to the production of speech. At the same time there is an enormous expansion in the frontal lobe. This certainly seems to bear out Sir Arthur Keith's contention that the Piltdown man was a relatively high type of human organization.

Comparing the Pithecanthropus brain with that of the great ape nearest to it, the gorilla, certain marked differences are shown. The animal from which this brain was obtained weighed about 400 pounds, and its brain weighed 545 grams, as compared with that of Pithecanthropus which weighs according to the cast 940 grams. The Piltdown brain shows definite advance over both the gorilla and the Pithecanthropus, and all three alike are definitely below the proportions and development of modern man.

After the Dawn Man of Piltdown the full day of humanity was long coming. A number of races of primitive man came and died out. And we do not know much about them except from the evidence provided by their utensils and flints. But one of these races, the Neanderthals, has left a very considerable record of itself. They inhabited the earth about 100,000 years ago. From all computations at present they were evidently a stocky race, very gorilloid in appearance, extremely muscular, short of neck, with a heavy mask-like face, not unlike some of the anthropoids. This race is important because it marked one great departure toward modern humanity. By some means or other, as yet not altogether understood, perhaps by the acquisition of the use of fire or the development of better instruments, these people dispossessed the great beasts of prey from the caves and themselves became cave dwellers. This fact in itself had a psychological influence on the human race, the effect of which has not yet been properly appreciated. It gave a tremendous impetus to man's possessive sense and laid the foundations for all those laws of possession which form the central core of our entire moral code. The brain of the Neanderthal, and this, by the way, is from the skull that was found in the valley of the Dordogue near the little village of La Chapelle aux Saints in 1908, was really larger than the brain of any known human race, even larger than that of modern man. It weighs 1,626 grams. But for all its great

weight it is really a brain which was much inferior to the modern human brain simply because it had an imperfect development in certain important details. In the frontal region there is a marked concavity which disappears as the brain of the *homo sapiens* is reached. In other respects also, particularly in the frontal region, the brain of the Neanderthal man is very much less developed than is the case of the higher races.

In studying the localization of this brain of Neanderthal man it becomes apparent that the speech centers are well developed, so also are the auditory centers, but the whole frontal region is flatter than what is seen in the *homo sapiens*. The brain is a better brain than that of the Piltdown or ape-man. These people show this improvement in the record which they have left both in the construction of flints and also in the industries with which they are now generally accredited.

Europe and Asia have contributed evidence of prehistoric man, the former in abundance, but it is only recently, 1921, that Africa gave any sign that primitive men had gone into that country. The Rhodesian brain is part of this new evidence. It was discovered by Mr. Harris at the Broken Hill Mine in Northern Rhodesia and found under such circumstances as to justify its inclusion among prehistoric brains. When I first began to study this brain it seemed to me that it should be classed among modern brains, but on closer scrutiny it appears very definitely to be inferior in its general construction to the Neanderthal brain. I am now inclined to believe that Elliot Smith is perfectly correct in saying this is a strangely "exotic cousin in our family circle" which dates back as far at least as the Piltdown race.

The first great experimental period in human evolution was drawing to a close when the Cro-magnon race made its appearance in Western Europe. These Cro-magnon people were remarkable because they were the first representatives of *homo sapiens*. They have been called the Paleolithic Greeks and undoubtedly deserve that name. Their entire history is made brilliant by their artistic achievements. They probably had devised some form of music, but it was in their carving and drawing of animal forms that their art reached its real heights. Many species of living and extinct mammals, birds and fish have thus been immortalized. The actual specimen of a Cro-magnon brain is not

yet available for study. There is an endocranial brain cast, however, by means of which we can draw certain analogies. This brain cast was obtained from certain Solutrean contemporaries of the Cro-magnon race. It belonged to the Great Mammouth Hunters of Predmost, who had much in common with the Cro-magnon. One of these Predmost brains, of which there are four or five well-made casts, shows that here at last the level *homo sapiens* has been finally reached.

The process of evolution through which the brain has passed in all of its various stages seems to be clearly shown by certain measurements and indices. Starting with Pithecanthropus and proceeding to *homo sapiens,* there is a definite increase in the width of the brain, that is to say, the cerebrum was expanding in those areas which had to do with sensation and more particularly with sensation of the hands and fingers. In its length a similar and even more striking increase in size is notable. This is due to the fact that the frontal lobe was developing, that part of the brain which has to do with the higher faculties, with reason and judgment, personality and experience. It is exactly here that the increase might be expected in the evolution of the human brain. The height of the brain also shows a similar increase.

The Cro-magnon, after his day, made way for a new race of men who came into Western Europe, Neolithic Man. This newcomer created a great change in human activities. He introduced a period of practical utilities; applied science was substituted for pictorial magic. Neolithic man had discovered the magic of agriculture. He may have prayed for his crops, but he also planted seed and tilled the soil. He may have had certain propitiatory rights for his hunting expeditions just as the Cro-magnon undoubtedly did, but he domesticated animals to guarantee an assured food supply. As herdsman and farmer he became a landholder, and this was a long and provocative step in the direction of modern humanity. It forced upon man the need to defend his claim and assert his right. Quickly this new assertedness extended itself to the ages of bronze and iron, with their much more rugged offensive mechanisms, and ultimately having extended itself into historical times, it proceeded to create all of the armed camps known to civilization, ancient, medieval and modern.

There can be little doubt that the progress of humanity has run parallel with the growth of the brain. From one age to another and from one race to the next man has shown a steady gain in his power to control material conditions. Where he has stood still, or perhaps even fallen behind, is in learning to control his own nature. The human cerebrum certainly marks the advances of intelligence step by step. When the brains of all of the prehistoric men which we know are placed side by side, including Pithecanthropus and Piltdown, Rhodesian, Neanderthal, Predmost and *homo sapiens,* there is not a question of doubt about this progress. Such progress in development is sufficient to convince the most skeptical. And yet for the most part the human cerebrum is looked upon as the finished product. Its evolutionary history does not bear out this view. It makes it seem much more probable that the brain of modern man is an intermediate stage in the ultimate differentiation of the master organ of life. In this sense the prehistoric brain is of more than antiquarian interest. It has a definite and living bearing upon the future progress of the race.

Dr. Clark. The discussion and exposition of Dr. Tilney will be continued in somewhat different and yet analogous relationship to the subject of the evening by Dr. White, of Washington.

Dr. White presented his prepared paper.

THE CONCEPT OF EVOLUTION AS APPLIED TO THE HUMAN MIND

William A. White, Washington

(Delivered before The New York Academy of Medicine, April 7, 1927.)

The subject of this symposium, The Evolution of Mind, suggests, at least, that there is a something to which the term mind is properly applicable and that this something undergoes, or has undergone, a process of change to which the term evolution may be applied.

It is perhaps unnecessary to remind this audience of the inherent difficulty that would confront one in any undertaking adequately to define mind nor to remind you that, not so long

ago, its consideration was from the standpoints of philosophy and morals. In other words, psychology, or the science of mind, has only lately become scientific, and only very recently been recognized as a biological science. I may further remind you that, not so long ago, psychology was dealing with faculties like the will and the intellect, that this manner of speaking and even this way of thinking are still with us, and that the behaviorist would rule consciousness out of consideration altogether, to indicate further the difficulty of definition mentioned not to say, also, the implication of radical changes, evolutive or otherwise, if not in mind itself at least in our conceptions regarding it.

My own point of view is that mind, as such, is indefinable in quite the same sense as are other ultimates, for example, energy, gravitation, electricity. We know something about what these so-called forces do, we know them by their effects, but we do not know the nature of the ultimate reality behind these effects; we do, however, give it a name. From this point of view it may be properly asked, What is the character of the activities back of which we postulate mind? My answer to this is that they are total reactions. When an organism as an integrated whole does something, as for example, when a lion seizes its prey, or when an amoeba engulfs a food particle, we can only describe such an act in psychological terms, and it is such acts, therefore, that we consider as emanating from what we are pleased to term a mind.

If this concept of mind, as I have stated it, is correct, it is at least mind as I conceive it, then the deduction is implicit that mind is an attribute of all living beings, at least for our purposes of all animals, inasmuch as they all exhibit total reactions in the sense indicated, reactions to which only descriptive terms that are psychological can be applied and which are purposive in character. Mind, therefore, becomes an attribute of the living being, one attribute among many and is no longer to be considered as a separate something, or mystical entity that is somehow associated with or engrafted upon the organism such as is implied in the faculty psychology or the parallelistic theory of the interaction of body and mind. Such being the case, I think we might expect to find, and as a matter of fact I think we do find, that the evolution of mind, of total reactions, is expressed as but one aspect of evolution in general.

From this point of view it will be seen that mind is so involved as an expression of the organism that any consideration of its evolution needs to be envisaged by the principles underlying the process of evolution in general, as it involves all living things and that it may not be considered apart. Evolution of mind, therefore, must be considered in connection and not apart from evolution of body. Psyche and soma are but different aspects of the organism as an evolving system.

It is true that we have been accustomed to think of evolution in the past as expressing itself in morphology. In speaking of an evolution of mind I am applying the evolution concept to a system of functions. But function is a matter worthy of consideration in its own right and its modifications, its development and evolution may be studied and recorded with the same propriety that we may study and record the changes in structure of the skeleton, and it may be said with results that have the same degree of probability.

The tendency to study function in quite the same way as is the practice to study structure seems to me to be an important one to recognize in the field of biology because, although it has not been definitely formulated as a methodological principle, it would seem that psychoanalytic investigations of recent years have been in effect an effort to study the development of the psyche in the individual and as a result of this study to develop a natural history of the psyche.

One of the reasons why the mind appears to have resisted so long the application of scientific methods would seem to be because it is intangible, invisible, and imponderable. I think these reasons need no longer stand in the way. Scientific method is as well served by a natural history of any given function as by the natural history of the honey bee or of the continent of Australia.

The implication of all this is that the human mind as we ordinarily know it in ourselves and contact with it in our fellows is an end result, the beginnings of which reach back to the beginnings of life, and that consciousness is the last link in a chain that reaches for millions of years into the dim distant past.

The study and the understanding of mind have been much hampered by a failure to appreciate these facts and by a type of

consideration that treated mind as a sort of imponderable, intangible, mystical entity without structure in the sense that we ordinarily think of structure in terms of organic make-up. If we can only put aside this prejudice and consider mind as we do the tangible body, think of its content as its structure and its processes as its functions, then we shall begin to see that we are confronted with problems regarding its evolution that are quite the same in kind as the problems of the evolution of somatic structure and function.

What are the sciences that have led us to our knowledge of organic evolution? They are comparative anatomy, embryology, and paleontology, and they have their counterparts in the realm of mind so long as we keep in mind the concept of total reactions rather than the concept of consciousness. The present understanding of mind is reached from a study of its development in the individual, its development throughout the course of man's recorded history, and the recognition of archaic rests that we find in the excavations made in individual minds by mental disease.

In this way we have come to a new understanding and evaluation of the child mind by recognizing that the relatively smooth and plastic child psyche is not the battle ground of the old time faculties but is more like the undifferentiated protoplasm of the amoeba, which only after long experience is to be organized into well-differentiated functional pathways. This relative simplicity is of course only our way of thinking about it; it only appears more simple, for it after all contains all of the potentialities later to be realized but in a form much less understandable, more mysterious, than in the later developed and more specific forms. We have come to see the analogies between these ways of thinking of the child and the ways of thinking of the savage, the primitive man; and we have come to a recognition of archaic material as it occasionally throws up both from a study of psychological reactions as such and also from a study of the functions of the developing and evolving nervous structures that underlie their manifestations and which furnish the pathways along which psychic reactions must find expression.

The study of the evolution of mind, therefore, must include the results of the comparative study of the development of the structures and functions of the somatic structures, principally, but

not alone; of the nervous system; the study of man himself in his march from the primitive stone age to civilization, his art, literature, religion, economic and political institutions; the psychology of primitive man and savages such as are at present living, of their customs, beliefs and institutions; the psychology of the child; and the psychology of the adult both normal and pathological. Along this way there are many special problems and many hiatuses. For example, the psychology of the special senses considered from the broad phylogenetic point of view is a special problem, and the psychology of the child before birth is a hiatus of probably considerable importance, for when we are born we are already far along on the path that begins with impregnation and ends with death, and a consideration of this intrauterine period might throw much light on the distinction between what is inherited and what acquired, about which we know so little. Another special problem is animal psychology which has been seriously attacked in the recent studies of apes; and another hiatus is our almost total lack of knowledge of the representation in the psyche of the various bodily organs, a representation that must be of the highest significance in the understanding of total reactions. The relation between emotion and adrenalin is an example in its simplest form, as is the possibility of the relation of a certain pathology of the pancreas and the sugar metabolism machinery to epilepsy, in which there are such tremendous explosions of affect.

The mind in evolution expresses itself at all these various levels or stages of development which we see fixed in the animal, the savage, the child and the adult, and the various components ontogenetic and phylogenetic, hereditary and acquired are woven into the final result in the complex plan that reaches its final expression in consciousness.

In the progress of evolution the processes of analysis and synthesis go hand in hand. Just as the undifferentiated protoplasm of the amoeba performs all the functions of ingestion, digestion and egestion, which later are elaborated in the forms of the special organs of the digestive system by the more complete analysis of the components of the more general functions of nutrition, and are at the same time integrated and brought together in separate organs for specific purposes, so the undifferentiated

psyche pursues a similar course from massive reactions to crudely analyzed stimuli, to a more detailed analysis of stimuli by the sense organs, and to more specific responses and at the same time a more elaborate integration in the various special fields. The irreversible process of evolution tends to carry these integrations to ever higher levels.

The phenomena of the evolution of mind have been described in their later stages as a change from feeling, concreteness, and perception in the direction of reasoning, differentiation, and abstraction. These changes together with the simultaneous changes in the directions of both analysis and synthesis can be advantageously illustrated at this point. I will use the growth of the concept of number. Originally a number was attached to some concrete object or objects and was a part of the global perception upon the basis of which the individual reacted. Two canoes were two canoes and tended to remain so. The two and the canoes were relatively inseparable or at least separable only under special circumstances. Analysis moves in the direction of separating these components and at the same time, because each comes to be considered, so to speak, in pure culture, a much more comprehensive synthesis of each is built up, so that two and canoes come in the course of time to have a much broader and deeper significance. Number, to take only one of the elements, emerges from this transaction in a highly abstract form with almost no suggestion left that it ever referred to specific objects; the movement can easily be seen to be away from perception and by a process of differentiation in the direction of intellectualization in the form of abstraction.

Such are the processes at work in the evolution of mind. The most significant thing about them is not their uniqueness but the fact that they are just the processes that we find throughout the manifestations of evolution in whatever realm we may examine them. However, there is something significant about their statement which should be emphasized. In the first place the fact that we find the same processes at work in the realm of mind that we find elsewhere is really of great importance, for we are by no means free from the mystical attitude toward the phenomena of mind which the scientific methods of the nineteenth century were not able to dispel. Mind still, for some reason, perhaps because

it is our last stronghold, appears different from the other phenomena of nature.

Secondly, and this will further illustrate the nature of the processes and disclose a component I have already mentioned but which is rarely appreciated, these processes disclose certain aspects of man's relation to his environment which are of importance. When a psychotic patient complains that he is the subject of strange influences that emanate from others he is resorting to a magical explanation of his feelings, and we coordinate his way of thinking with that of primitive man and the child at a stage of development at which they had not succeeded in adequately differentiating themselves from the outside world and so felt the forces of that world as an intimate part of themselves. The stage of animism. This is a phenomenon we are familiar with. I think of many illustrations in the realm of art. For example, we can trace the oriental features of the arch as a structural unit as we see it employed in Rome many hundreds of years after its original use.

Apropos of this relationship to man and his world it has been customary in certain quarters to equate these experiences. First, when man had to give up the idea that he was the center of the universe as a result of the overthrow of the Ptolemaic astronomy. Second, when he had to give up his idea that he occupied a unique position in the world of creation as a result of the "Origin of the Species." And third, when he had to give up the conviction that his individual personality was a unique possession which made him different and separate from all others and over which he had full control as a result of the psychoanalytic principles. In other words, man has gradually had to give up the idea of his own uniqueness. This progressive contraction of his importance in the universe and therefore the lessened influence which he has upon it or can make it have upon him (propitiation of the Gods and vengeance of the Gods) goes hand in hand with an expansion, corresponding in degree, of his detailed knowledge both of the universe and of himself, and, in consequence, of his real position in the universe. In other words, here we have an excellent example of the parallel progress of the two opposites, analysis and synthesis. Therefore the progress from perception to abstraction, for example, only expresses half the truth, for abstraction in-

creases the accuracy of perception; in other words, these other processes also go along together as paired opposites, to my mind, an important aspect of the process of evolution as a whole.

No department of science illustrates any better than psychology the importance of a four dimensional consideration, the need of utilizing the temporal coordinate. Yet no department of science has been more loath to go the whole way in this direction, no doubt because of our crude ideas of the intangible and imponderable mind. The developments in modern physics ought to help us to escape from these hindrances and to realize that if we will not be obsessed by a feeling of mysticism, but will proceed just as we would in the study of any other living thing, we will find here as we have already found there that the present depends upon and expresses the past in a very real sense, and as for the future, why that is the Great Adventure. For the future is the region of the unpredictable. Into it enter elements with which we are unfamiliar and the results of their actions cannot be known beforehand. Every emergence into a new set of conditions with a broader horizon of possibilities involves the unknown and the unpredictable. This does not mean that a legitimate conclusion from unpredictability is indeterminism. There is no warrant for such a conclusion. It does mean that determinism seems only to be applicable to lower orders, never to the highest. Science, by endeavoring to explain the higher by the lower, has created pseudo-problems such as the body-mind problem. Our new synthetic and dynamic point of view would reverse the process. Surely quite as legitimate and, also, a quite worth while undertaking with possibilities of greatest importance, I believe. It is because of the unpredictability of the emergent state, of the impossibility of explaining the higher by the lower, that our material progress has so outstripped our methods of personal relations. We must learn to re-evaluate our lives, to control the lower for the service of the higher and to study the emotions and apply our knowledge of these as successfully as we have the intellectual processes.

This adequate understanding of man's place in nature is of first importance for understanding the evolution of mind, the outward manifestations of which we call civilization. So long as man remained in the animistic stage, still part and parcel in his

feelings of the outward universe, he was completely subjected to it at the pleasure of the gods whom he could only influence by propitiation. It was essential to differentiate himself from the rest of the universe in order that he might efficiently relate himself to it. Unfortunately this process is such an exceedingly slow one, the cultural lag is so great, that upon this one factor alone it is conceivable that the whole future of our civilization may hang. The thinking of the great majority of people is shot through with evidences that clearly ally it with that of primitive man, and yet we are trying to maintain a civilization in which such thinking, if it could ever become controlling, would be absolutely destructive. The immediate problem of the future is to make the things we already know function in our living, not to think in the twentieth century and live in the seventeenth.

Let me close with a story, a hope, and a speculation. Sometime ago, when the requirements under a new law made it necessary to re-examine chauffeurs before re-issuing licenses to them, a young man was found who was engaged daily in running a large commercial truck. This truck he took from the garage each morning, made the required trip each day, and brought it back in the evening. Apparently he fulfilled his duties in a perfectly efficient and satisfactory manner. An examination, however, of this boy disclosed the astounding fact that he did not know that in order to make the truck go it was necessary to supply it with gasoline. I tell this story because it appeals to me as illustrative of certain, at least alleged, attributes of our present day and age. I think it is generally believed that during the recent scientific era of development there has been an enormous evolution of man's environment without a corresponding degree of evolution in his mental capacity. I suppose most of us manipulate many of the inventions which are in daily use with very little more information about their intrinsic mechanisms than the chauffeur who did not know gasoline was needed to make his truck go. And like the chauffeur we get along nicely most of the time. It is only when things go wrong that the great hiatus between our knowledge and the marvellous mechanisms which we control is disclosed. Should the truck run out of gasoline the capacity for adjustment of the chauffeur to the situation thus created would probably be zero. Is it possible that this illustration has an ele-

ment of truth in it for our existing civilization? Is this civilization like the motor truck, and is it being run by an intelligence which has dangerous lacunae so that satisfactory results can only be counted upon when no unusual element is introduced into the picture?

If there is reason to believe that man's mental development as a whole has not kept up with the increase in the complexity of his environment, then it is the hope of the mental hygienist that the present—the twentieth century—which has started off during its first quarter with such an apparent awakening of man's interest in himself and in his mind, may be as significant for the future as were the early beginnings of the scientific era as represented by Copernicus, Galileo, Newton and Bacon, who developed those fundamental laws of our physical surroundings which are now in every school text-book, and those methods of approaching scientific problems which are so important to their utilization.

If there is this great discrepancy between man's knowledge of himself and his knowledge of his environment, and if as a result civilization is really in any serious danger, then it is perhaps worth while in closing to call attention to one aspect of mental phenomena which would seem to have outstanding significance.

In our psychotherapeutic work we have come to a realization that the mind can accomplish what on the face of it seems to be impossible. A mind that is in conflict with itself, that is torn between two diametrically opposed and divergent motives can, under favorable circumstances, bring to pass a solution of this apparent *impasse*. A simple illustration will give you some idea of what I mean. A woman had what we call an ambivalent attitude toward her daughter. She both loved her inordinately and hated her roundly. On some days she could not do enough for her. On other days she could not do enough against her. The swing of her emotional relationship towards her daughter was equal and in opposite directions. It is very interesting how this woman attempted to solve this problem of these opposing tendencies when she came to make her will. She was possessed of some considerable property, and in her will she left it all to the daughter she loved, but she so tied it up in a trust that the daughter whom she hated could never get it in her lifetime.

In some subtle way the human mind has this capacity for resolving opposites, for bringing a solution out of a situation

where solution seems impossible, something after the Hegelian formula—thesis, anti-thesis, synthesis. This ability of the human mind has not been sufficiently recognized nor its importance sufficiently stressed.

When out of opposing forces a new synthesis comes about, this synthesis is an emergent in the sense which I have indicated in referring to the theory of emergent evolution. And perhaps, too, it has the elements of a mutant. In any case a problem, because it seems insoluble, because the forces on either side appear to be arrayed with absolutely equal power one against the other, need not, for that reason, discourage us. The mind has its way of overcoming such difficulties. It is true that it does not always succeed. We see in our patients who reach *impasses* of one sort and another that some of them fail in the ordinary sense in which that term is used; some of them fail by developing a psychosis; both of these failures are partial failures. Others fail completely and commit suicide. But in the great number of people who do not fail in these ways a mechanism has been brought into operation which solves the problem by a synthesis of the opposing forces. So with regard to the present situation this may be the outcome if the facts are as assumed. The outcome may, however, on the other hand, be postponed until a sufficient tension is created between the opposing forces. In any case the mental hygienist looks forth hopefully into the future because he does believe that a degree of interest of mankind in himself has been developed during the present century that is far greater than ever before, and he may perhaps be excused if in this new field of endeavor where there is so much of mystery he indulges some in speculation.

FUNDAMENTAL DISCOVERIES OF THE LAST DECADE IN HUMAN EVOLUTION[1]

HENRY FAIRFIELD OSBORN

(Delivered before The New York Academy of Medicine, April 7, 1927.)

It is interesting to recall that when I first came to New York nearly thirty-five years ago I was invited to give the Cartwright lectures before The Academy of Medicine, and that I chose as my subject for one of the course of four lectures "The Contemporary Evolution of Man." That was in the year 1892, and since that time I have been deeply interested in this, to my mind, supreme subject of the whole problem of evolution. As man is crowned king of the rest of the animal kingdom, the evolution of man is certainly a matter of supreme interest. The greater part of the attention of anatomists has heretofore been directed toward the bodily evolution of man, and most of the triumphs of discovery resulted in the placing in past time of one after another of our human ancestors represented by more or less complete remains. But of late the subject has taken a new and very important turn in the examination of the brain structure and the mental powers of these men and women—for we also have women, like the Gibraltar woman—their art and their industry, so that the question now bears directly upon the subject announced by your Chairman as the first of these discourses.

In the time which I have set for this brief introductory address, I shall endeavor simply to lay down, without giving any evidence at all, what I conceive to be the most fundamental discoveries especially of the last decade: First, the very great antiquity of man or of the human race. As our conception of the antiquity and extension of the universe has been broadened and widened through the marvelous discoveries in astronomy during the last decade, so our conception of the antiquity of man, based not on theoretic considerations, but upon actual discovery, has been greatly broadened and the early date for the antiquity of man has been extended hundreds of thousands of years. The first

[1] Compare Osborn: *Recent Discoveries Relating to the Origin and Antiquity of Man.* Address before American Philosophical Society, April 28, 1927, on the occasion of the celebration of the two hundredth anniversary of its foundation.

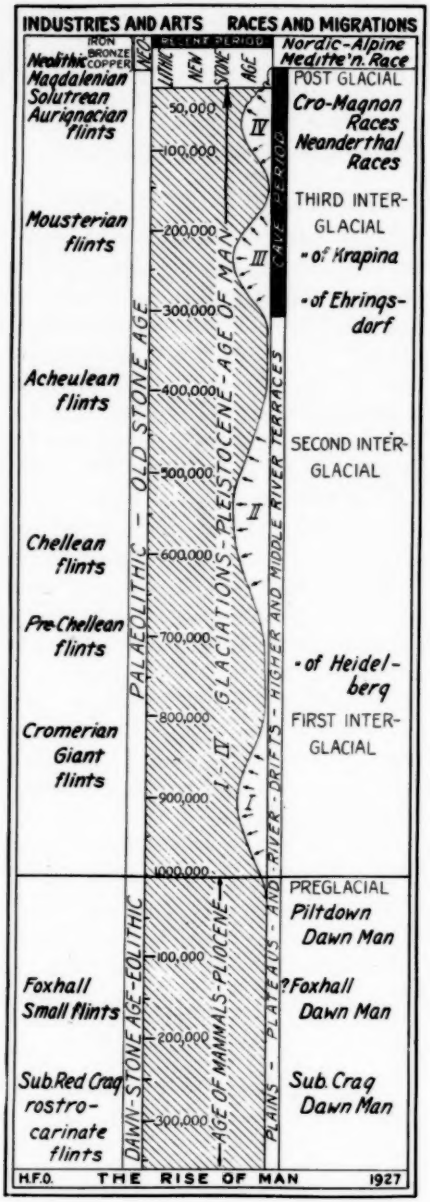
INDUSTRIES AND ARTS
RACES AND MIGRATIONS
IRON
BRONZE
COPPER
Neolithic
Magdalenian
Solutrean
Aurignacian
flints
Mousterian
flints
Acheulean
flints
Chellean
flints
Pre-Chellean
flints
Cromerian
Giant
flints
Foxhall
Small flints
Sub Red Crag
rostro-
carinate
flints
PRESENT PERIOD
NEOLITHIC
NEW STONE AGE
CAVE PERIOD
PALAEOLITHIC - OLD STONE AGE
A - IV GLACIATIONS - PLEISTOCENE - AGE OF MAN
HIGHER AND MIDDLE RIVER TERRACES
RIVER - DRIFTS - PLATEAUS - AND PLAINS -
DAWN-STONE AGE-EOLITHIC
AGE OF MAMMALS-PLIOCENE
50,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1000,000
100,000
200,000
300,000
IV
III
II
Nordic-Alpine
Mediterr'n. Race
POST GLACIAL
Cro-Magnon
Races
Neanderthal
Races
THIRD INTER-
GLACIAL
- of Krapina
- of Ehringsdorf
SECOND INTER-
GLACIAL
- of Heidelberg
FIRST INTER-
GLACIAL
PREGLACIAL
Piltdown
Dawn Man
?Foxhall
Dawn Man
Sub. Crag
Dawn Man
H.F.O.
THE RISE OF MAN
1927

CHART I

man discovered was Neanderthal man, who can be assigned approximately a date of 600,000 years. That has been pushed backwards until now we have the geological date for man at the very beginning of the Age of Man, and we regard the so-called Heidelberg race as an ancestor more remote than the Neanderthal race, with an antiquity of one million years. Still more recently we have traced man back of the Age of Man into the Age of Mammals or Tertiary period and have discovered no less than four cases of the occurrence of the human race during the Age of Mammals—not a very primitive form of the human race either.

I have taken special pains in my preparation for this discourse this evening to inquire as to the probable date to be assigned to the Piltdown race found in Sussex, England, and I think I may state positively that the Piltdown race belongs close to the Age of Mammals and may be assigned with considerable confidence an antiquity of 1,250,000 years. That race we know as *Eoanthropus*. The brain of the Piltdown man has a cubic capacity of 1240 ccm., which is larger than the average of some existing races. Consequently, we have evidence of the existence of man with a considerable degree of mentality 1,250,000 years ago. In East Anglia, on the eastern coast of England, have been discovered not the remains of the skull, but the remains of the implements of two races, the Foxhall and the so-called sub-Red Crag races, which are still more ancient than the Piltdown, or well down into the Tertiary period or Age of Mammals.

That age is known only by the flint implements produced. Now, we look at those crude flint implements and at first think it does not require a very high order of intelligence to fashion them. But try, yourselves, to make one of these implements out of a rude boulder of flint; you will find that you are up against a very difficult mechanical and technical problem. The distinguished archeologist, J. Reid Moir, of Ipswich, who has practised flint-making for years, is unable to produce a flint of the beak-keeled type comparable to those fashioned by these men. These flints indicate considerable dexterity, also that the human hand of that period was as capable as the human hand of to-day; they indicate a mind controlling the hand and directing it, almost as capable as the modern mind, so far as mechanical design and purpose

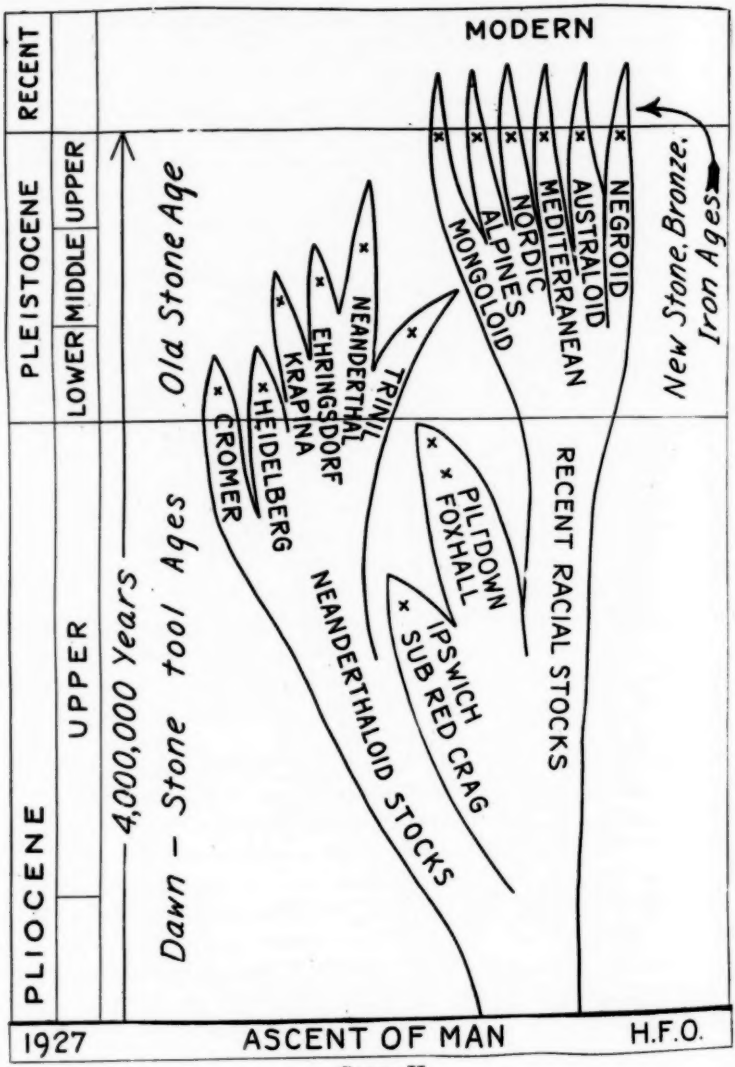
MODERN
NEGROID
AUSTRALOID
MEDITERRANEAN
NORDIC
ALPINES
MONGOLOID
New Stone, Bronze, Iron Ages
RECENT RACIAL STOCKS
PILTDOWN
FOXHALL
IPSWICH
SUB RED CRAG
NEANDERTHALOID STOCKS
TRINIL
NEANDERTHAL
EHRINGSDORF
KRAPINA
HEIDELBERG
CROMER
Old Stone Age
Dawn – Stone tool Ages
4,000,000 Years
RECENT
PLEISTOCENE
LOWER
MIDDLE
UPPER
PLIOCENE
UPPER
1927
ASCENT OF MAN
H.F.O.

CHART II

are concerned; they also indicate a variety of occupations—that these men engaged in the chase, that they fashioned wood as well as flint, that they knew the art of fire (which the great poet Aeschylus told us was the gift of Prometheus to the human race), one of the great discoveries in the prehistory of man. Besides fire they undoubtedly had clothing, because certain of these flints were for the purpose of dressing hides.

Amazed as we are by this recent discovery, there are still other discoveries which I am not at liberty to announce this evening, carrying the tool-making period of man back into Middle Pliocene time and thus giving the human race an antiquity ten times the original estimate, or in the neighborhood of four million years—an almost incredible antiquity, certainly absolutely incredible from the standpoint of our knowledge of twenty years ago. We find Tertiary man not a low-grade animal half way between the ape and the modern type, but a man standing erect, with full control of his faculties, with a social system developed, with powers of travel, of exploration, of enterprise, and with ability to direct his mind and will against his contemporary animal enemies, also with a brain and with a well-developed frontal skull region.

The second interesting point, therefore, and a comparatively novel one, is the separation of man from the apes, because our literature, our stage, our movies, and our comic papers are all still full of the old ape-myth, as I call it. Science has its myths as well as Religion. I have myself seen an anthropologist before a great audience of the sociologists of the world in the University of Cambridge run up a line of animals all placed erect, in which he began with the low type of monkey, gradually ascending through the various types of anthropoid apes—the orang, chimpanzee, gorilla, gibbon—and finally reaching the human stage.

To-day we know through another line of research and by actual observation of the living apes of Africa during the explorations of Akeley that the apes are essentially arboreal animals and essentially quadrupedal when on the ground. Although they have many strong points of likeness to ourselves, the apes have been arboreal and quadrupedal on the ground for an enormous period of time, while man during the same period has been erect and has been compelled, by non-recourse to trees for pur-

poses of defense, to use his hands, to develop implements, and to develop his courage and powers of resistance in overcoming difficulties. Thus all the higher feelings and moral traits characterizing the finer primitive races of man to-day are of great antiquity.

Moreover, man has a peculiar habit, namely, the habit of the free use of his hands. This brings us to our next subject, that is, the relation of the development of the hands to the development of the human mind. The tool-making habit we may confidently assign to a period much greater than 4,000,000 years, because tool-making required long antecedent periods of invention, discovery of new types and new uses for tools; there were new human needs to be met, and possibly the fashioning of ornaments used in the social life of man. Thus, during the long tool-making period of a wood age, then of a bone age, then of a stone age, and finally of a metal age, ending with the introduction of bronze, of copper, of iron, and finally of steel, we find that man's mental development progressed step by step with his inventions.

What powers may we grant to these primitive men? In the first place, I think we may say that since they were social animals all the fundamental moral traits and social traits which we possess to-day were developed during that period. Mutual helpfulness and clannishness brought groups of men to work together to accomplish certain purposes, among them the care and protection of the family. Many existing uncivilized human races show certain of the qualities which we should call high moral traits; few human races show all of them, but they are scattered here and there and we may be sure that the same was true of the races of the early period of human history.

Thus we come to the higher side of man—the intellectual and spiritual side and the artistic. And here we enter into what is to my mind the most difficult field in the whole realm of biology, because we are entirely at a loss to give any adequate explanation. We can only look at the facts as they are. Let me digress a moment. Speaking before this audience of wide reading and culture, I may briefly allude to three great lines of thought with regard to the upward steps of evolution, including, of course, human evolution. The first, as old as Empedocles, 600 B. C., was

the *trial and error* theory, the experimental method which started with Empedocles and culminated with Charles Darwin and Weismann—namely, that by the survival of the fittest in mind and intellect the human mind might be built up.

The second great line of thought we may call the *experiential*, the idea of inherited experience. This, of course, you recognize as the line of thought of Lamarck, culminating in the great work of Herbert Spencer. That, too, while considered a great factor in its day, has been found wanting. We do not live on inherited experience or individual experience. We live through the advantage given by inborn faculties and predisposition which happen to coincide and help us in a particular form of environment.

Finally, we come to the third great idea, which was voiced by Aristotle in discussing the question of human evolution, 300 B. C. He calls it the principle of law, more recently known as the *creative principle*. This creative principle is adaptive, and the only word we can use not to be construed in a theological or religious sense but in a purely scientific sense implies the origin of powers and faculties, like the origin of certain physical powers in the human body, without antecedent experience and without antecedent trial or error. The culmination of years of research on my part and the part of others devoted to this specific problem has brought us to the view we must accept: we must modify the original idea of evolution and connect it with the idea of the older word creation—in brief, creative-evolution.

I can give only one or two illustrations of very simple character. Take the grandest illustration we can cite, the *Homo sapiens*. The ancestors of *Homo sapiens* came out of the forests in the northern part of Europe. They belonged to the same race as that to which the majority of us present here tonight belong. Their faculties for civilization could not have been developed by long antecedent experience, or by trial and error. Take another illustration: My son's regiment during the war at Camp Meade consisted of negroes. When I went to see him he said, "Father, I have a very talented black here. He is the best mathematician in the regiment. I would like to have you look at him and tell me whether he is a pure-blooded black or whether he has some white blood. I call him Charles Dar-

win." I examined the negro, and I assure you he was full-blooded. He was better able to calculate the flight of projectiles than any other private in the regiment and better even than my son himself. Of course, they had explained to him the mathematical principle. He never had studied mathematics, but he had in his mind the creative capacity.

These two simple illustrations might be multiplied a hundredfold. Take the case of a Peruvian artist who came to New York bringing two Peruvian boys out of the forests of South America, native Indian boys so absolutely crude and untrained that they had no manners and had to be practically house-trained. I saw those boys three years later, dressed in neat sailor suits. They spoke three languages in addition to their native Indian tongue—Spanish, French and English. They were placed in a church school and they stood well in their classes. What antecedent experience had there been?

The same evidence for this creative element which we observe rising in all parts of the organism, we observe rising in the mind. But I must not transgress on the very interesting addresses to follow me, so I will close by showing you a few illustrations bearing on this subject of the antiquity of man.

Explanation of the Illustrations

Chart I. A line separates the Age of Man and the Age of Mammals. The area above the line represents the Age of Man, which is now estimated at one million years. Below is an area which represents the sum of the Age of Mammals, estimated now at 300,000 years. Here we find the sub-Red Crag dawn man, capable of making the flints I spoke of as rostro-carinates. Above this is the Foxhall dawn man making a great variety of flints, and then the Piltdown dawn man making a few flints; Piltdown man, with a cranial capacity of 1240 ccm., gives us our first knowledge of the brain, the first concrete evidence we have of human intelligence at a period which may be soundly estimated at 1,250,000 years. The Foxhall flint layer, in which we find fireplaces and a different type of flint, stood the test of the most rigid inquiry on the part of French archeologists, although it received for fifteen years the greatest incredulity all over the world. In fact, I was not convinced myself until I visited there.

The rostro-carinate ('beak-keeled') flint is an implement which was used in the chase. There are types of implements indicating a great variety of occupations on the level slightly above the Foxhall level near Ipswich, England. A jaw of modern human type, with a prominent chin, was found in the Foxhall quarry and was recorded by an American dentist living in London. Unfortunately it was not preserved and one of the greatest calamities of science is that it has been lost. We can not authenticate it as absolutely belonging in this level.

A tree of the human race by Professor Gregory, of Columbia University, makes a sharp division between the anthropoid apes —gorilla, chimpanzee, orang and gibbon—and the human stock, going back to a period now estimated at fifteen million years, on the dividing line between the Oligocene and Miocene. The brain of the Trinil type will be more fully explained to you by Dr. Tilney. The profile of the Piltdown man of Upper Pliocene age shows an efficient chin, a well-developed head and a very comfortable brain capacity. The profile of a modern Bushman in South Africa, known to be a man of talent, has a similar brain capacity to the Piltdown man—the one modern and the one living 1,250,000 years ago.

Chart II is a recent summary. Fossil stocks are indicated on the left branch, ending in the Trinil, Neanderthal, etc.; modern stocks are represented by the branch to the right terminating in the Mongoloid, the Alpine, the Caucasian, Negroid, etc. Down below, a period four million years back presents the fossil bone implements, which give that very remote date for the tool-making powers of man.

THE MANAGEMENT OF MEASLES IN HOSPITAL AND HOME[1]

(Abstract)

HENRY JAMES SPENCER

(Delivered before The New York Academy of Medicine, March 17, 1927.)

Two points of approach are necessary to a consideration of this subject. The first concerns the stage of the disease, the second the place where it is treated.

Exposed, susceptible cases occur chiefly in the general hospital and the home. Every attempt should be made to prevent exposing the group under five years of age because of its high mortality rate (90 per cent. or more). Prevention of exposure is at present too much to expect in the home but can be attempted in the hospital. There physicians and nurses can do a great deal if always on the alert. Special contagious disease experience will prove helpful. The aseptic technic should be applied to every pediatric service to cut down contacts for a period long enough to assure freedom from contagion. This method requires thorough training of the entire medical, surgical and nursing personnel and the utmost cooperation of all concerned. Not all contagion will be eliminated but it will be greatly reduced and sufficiently localized to prevent closing a whole ward or division.

Prevention or modification of a threatened attack of measles lies chiefly in administering convalescent or adult serum. Three thousand seven hundred and twenty-one cases receiving convalescent serum before the eighth day gave 3,237 (87 per cent.) completely protected; 434 (11.7 per cent.) modified measles; and 50 (1.3 per cent.) unmodified measles with no deaths. Solomon and a few others report about 16 per cent. deaths where the optimum dose or type of serum was not used. Adult serum has proven valuable in the relatively few trials recorded. The specific sheep serum of Degkwitz is still on trial. The duration of the passive immunity produced by serum is so brief as to require frequent reinoculation where exposure is repeated.

[1] This article is to be published in full in the Jr. of the A. M. A., October.

The mortality in childhood is due chiefly to factors which reduce resistance to disease. Crowding, with its close contacts, lack of proper food, sunlight, cleanliness, fresh air and adequate medical attention are large factors counting against a child, and statistics from several sources prove this conclusively. Every physician should carefully consider the child's home environment and decide for or against the hospital on this account. Statistics from the Willard Parker Hospital for 1926 show 45 per cent. deaths among those admitted with bronchopneumonia, and 31 per cent. where bronchopneumonia developed after admission.

Rest, warmth, plenty of air and light, good food and good nursing are the great essentials. The child ill with measles should be isolated for its own protection, and no one with a respiratory infection should be allowed near it unless protected by a mask. Those who handle the child should in addition observe the principles of aseptic technic. The mortality in any large group of measles victims is much higher when acute respiratory infections are prevalent.

Convalescent serum practically eliminates the catarrh of measles. Thus the respiratory tract is less vulnerable to secondary invaders, bronchopneumonia is practically eliminated and mortality is reduced.

When measles appears in a hospital (1) immediately isolate developed cases; (2) isolate susceptible contacts showing unexplained fever; (3) discharge all possible children who have had measles; (4) install aseptic technic especially if no isolation rooms exist; (5) prevent secondary infections; (6) give the best of nursing care.

In the contagious-disease hospital the aseptic technic is very important but must not displace or weaken the nursing care. Properly-trained nurses and physicians can furnish both excellent nursing and thorough aseptic technic without too great an increase in the personnel provided they are conscientious in their work.

The sole purpose of the aseptic technic is prevention of cross or secondary infections. This method was apparently begun by Grancher some thirty-five years ago. Separation of patients by sufficient air space or by some type of partition prevents droplet infection. Surgical asepsis prevents the transfer of infectious

material from patient to patient by means of the hands, clothing, instruments and utensils of doctors, nurses and orderlies. Confining the patient to a restricted area which is contaminated by himself alone completes the system.

The results fully justify the laborious technic. With experience, time- and labor-saving modifications will undoubtedly appear. This is very important where 3,000 and more contagious patients are handled each year. The value of the method may be judged somewhat by the reduction in mortality and further by the reduced incidence of cross infections. The Willard Parker Hospital records from 1919 to 1926 inclusive, a series of 9,000 measles cases, yield the following figures. Aseptic technic for measles was instituted in 1924 and developed to full form in December, 1925. Since larger epidemics appear in alternate years three sets of figures are given: 1919–1923 (two epidemic and three interval years); 1920–1922 and 1924–1926 (each two epidemic and one interval year).

Percentage mortality—

	1919–1923	1920–1922	1924–1926	
Borough of Manhattan	2.88	2.97	1.96	
Willard Parker Hospital	15.67	17.77	9.16	(expected 11.73%)
Per cent. borough cases admitted to Willard Parker Hospital	7.89	7.15	7.87	
Per cent. borough deaths occurring in Willard Parker Hospital	42.96	42.74	38.34	
Ratio—Per cent. cases to per cent. deaths 1:	5.44	5.98	4.87	

317 deaths expected during 1924–1926. 258 deaths occurred.

Secondary Infections Table

		Per cent.
1922–1923. Total cases contagious disease admitted	8220	
Total secondary infections after admission	159	1.93
1924, '25, '26. Total cases, etc.	10209	
Total secondary infections, etc.	86	0.84
In the measles service for 1926 the cross infection rate was		0.53

The aseptic technic is only as strong as the weakest link in the human chain practising it. One person can in a few moments undo the careful work of many.

Abstracts of Papers Presented at Section Meetings

Section of Neurology and Psychiatry, February 8, 1927

THE PALAEOMORPHOLOGY OF THE HUMAN HEAD: TEN STRUCTURAL STAGES FROM FISH TO MAN

WILLIAM K. GREGORY, PH.D.

The human head is a sort of multiple palimpsest whereon is imprinted the traces of many successive stages. From the earliest protochordates of pre-Silurian times it inherits the ground plan of chordate organization in which the nerve tube is dorsal to the notochord, which in turn is dorsal to the gut.

From the ostracoderm of protognathous stage of Ordovician and Silurian age the human skull inherits its basal vertebrate pattern, with the paired olfactory, optic and otic capsules in antero-posterior series. In this stage the pineal body was well developed.

From the primitive gnathostome stage of pre-Devonian age the human skull derives those earlier ontogenetic stages in which the "primary jaws" and the braincase are laid down in cartilage. The mother mass of the jaw muscles, serially homologous with certain muscles of the gill cartilages and innervated by the mandibular branch of the trigeminus, also dates from this primitive gnathostome stage.

From the air-breathing, lobe-finned ganoid stage of Lower Devonian age the human skull derives its dual character as an integrated complex of an endocranium, preformed in cartilage, covered by and fused with a sheathing of dermal elements. The existence of dentigerous premaxillae, maxillae and dentary bones also dates from this stage.

To the earliest embolomerous amphibian stage of Lower Carboniferous age the human skull owes the elimination of the entire

opercular-branchiostegal and gular series of dermal plates. To this stage the human skull owes its general tendency to conform to the basic skull pattern for all tetrapods in so far as it retains in the dermocranium paired nasals, frontals, parietals, interparietals, premaxillae, maxillae, dentaries, gonialia, jugals, squamosals, dermo-palatines, pterygoids, unpaired vomers; and in the endocranium, median supraoccipital, basioccipital, basisphenoid, presphenoid, ethmoid, paired exoccipitals, periotics, mallei, incudes, intercalaria, stapedes, alisphenoids, orbitosphenoids. It is true that the identity of certain of these elements in the human skull with the corresponding parts in the oldest amphibia is at first sight far from clear; but by means of the intermediate conditions supplied by the skulls of the extinct mammal-like reptiles, together with the comparison of the ontogenetic stages of recent amphibians, reptiles and mammals, the solution of such outstanding problems as the origin of the ala magna of the sphenoid complex and the derivation and homologues of the auditory ossicles now seems tolerably clear.

To the earliest reptilian stage of Upper Carboniferous age the human skull owes the elimination of the postsplenial and coronoid elements of the mandible.

To the earliest theromorph stage of the Permo-Carboniferous the human skull owes the elimination of the intertemporal and supratemporal elements, the trophibasic modeling of the skull, and the first appearance of a temporal fossa.

To the earliest therapsid or mammal-like reptile stage of the Middle Permian the human skull owes the elimination of the postfrontal, the dorsal growth of the maxilla, the exclusion of the lacrymal from contact with the nasal, the enlargement of the temporal fossa, the differentiation of the teeth into incisors, canines and postcanine teeth, the beginnings of the ascending ramus of the mandible.

To the latest or cynodont therapsids of the Triassic the human skull owes the dorsal growth of the maxilla, which gains contact with the nasal, the mammalian character of the zygomatic arch and temporal fossa, the mammalian character of the epipterygoid, transformed into an alisphenoid at this stage, the development of an ascending ramus of the dentary, the full differentiation of the dentition into incisors, canines, premolars, molars. In the

human embryo the incus and malleus have the relations of the quadrate and articular jaw elements of the cynodonts. To this cynodont stage the human skull owes also its double occipital condyles, its secondary palate, the reduction of the pterygoid and the loss of its contact with the quadrate, the virtual elimination of the ectopterygoid, and the beginning of the ethmoturbinal scrolls.

To the proto-mammalian stage, perhaps of the Upper Triassic age, the human skull owes above all the establishment of a temporomandibular joint after the manner described by Gaupp, through the further upgrowth of the ascending ramus of the dentary till it gained contact with the squamosal. To this stage it owes also the reduction of the quadrate and articular to the size of the incus and malleus. From this stage dates the complete elimination of the postorbital bone, the fusion of the paired dermoccipitals into an interparietal, the completion of the secondary palate, the final reduction of the pterygoid bone, the fusion of the otic elements in a periotic mass, the full development of the turbinate elements.

To the primitive primate stage, dating from the Lower Eocene, the human skull owes the beginning of the contact of the frontals with the jugals behind the orbit; also the incipient enlargement of the eyes and the fundamental pattern of the upper and lower molars.

To the primitive anthropoid stage, dating perhaps from the Miocene age, the human skull owes the shifting of the eyes to the front of the head, a good part of the downward bending of the face upon the cranium, the early fusion of the premaxillae with the maxillae, the reduction of the dental formula to $\frac{2}{2}$ C $\frac{1}{1}$ $\frac{2}{2}$ $\frac{3}{3}$ and the general patterns of the upper and lower incisors, canines, premolars, molars.

From the protoanthropoid stage is derived the shutting off of the orbits from the temporal fossa, and the general modeling of every bone of the skull, which differs from that of the anthropoid only in the quantitative development of certain parts.

Section of Surgery, March 4, 1927

EMBOLIC AND METASTATIC PHENOMENA IN PLEURAL AND PULMONARY INFECTIONS

PAUL W. ASCHNER

The association of brain abscess with pulmonary suppuration is well known and commonly referred to as "metastatic" brain abscess. Schorstein collected sixty-nine cases, thirty-eight of which occurred with bronchiectasis and fifteen with empyema. The empyema cases were chiefly those of chronic type with persistent sinus long after operation. Of fifty-one cases of the series thirty-three presented a solitary brain abscess, of which twenty-five were in the left cerebral hemisphere. That organs other than the brain may present metastatic abscesses in cases of lung infection is little known. Martius collected twenty-two cases of brain abscess of pulmonary origin in six of which abscesses elsewhere in the body were discovered at post-mortem examination; in the kidneys, liver, spleen, heart muscle, and ovary.

Following the influenza pandemic of 1918 empyema due to pulmonary disease of various types was frequent. I observed three cases of aseptic cerebral embolism at this time in young individuals with *no evidence of cardiac disease* to which the emboli might be traceable. All three presented a right hemiparesis or hemiplegia; two recovered completely, in one a spastic lower extremity persisted. In Case 1 hemiparesis occurred two days after drainage of a streptococcus empyema. In Case 2 left hemiplegia occurred a week after the chest was Potained. Subsequently a pyopneumothorax and bronchial fistula were proven by operation, indicating that a lung abscess had perforated. Spastic paralysis of the lower extremity was present four years later. In Case 3 an unresolved pneumonia of the right upper lobe was demonstrated by X-ray.

It seems reasonable to ascribe the embolic lesions in all three to thrombi in the pulmonary veins in the vicinity of the diseased lung parenchyma. In the third case there was, moreover, embolic occlusion of the right common iliac artery, resulting in dry gangrene of the lower leg and foot. The leg was amputated just

above the line of demarcation; the arteries in the specimen were not occluded.

Three other cases of embolism of large peripheral arteries were observed. A man of sixty-four with infiltrated lung and encapsulated empyema developed embolism of the right brachial artery, symptoms of cerebral embolism and died. A boy of eight with lobar pneumonia and pleural effusion presented the picture of saddle embolus of the aorta. At operation both external iliac arteries were found occluded, the embolus having evidently broken. He died soon after the embolus in the left iliac artery had been extracted. A man of forty-one upon whom bronchostomy was performed for lung suppuration developed the signs of saddle embolus. Under observation the embolus apparently broke, one fragment occluding the right common femoral artery, the other the left popliteal artery. He recovered without operation, no gangrene developing. In this group of cases it also seems reasonable to ascribe the emboli to thrombi in the pulmonary venous radicles.

The emboli in all these instances were either aseptic or carried organisms of such low virulence that suppuration did not supervene. The distinction between septic embolism and metastatic infection is one of degree rather than of kind. In the first instance an infected gross thrombus is thrown off into the circulation. If such a thrombus originates in a venous radicle of the greater circulation it will lodge in the lung unless there be a patent foramen ovale. If it originates in the lesser (pulmonary) venous system it will lodge in an artery of the greater circulation, most commonly in the brain. In the second instance (metastatic infection) bacteria, singly or in small clumps, are thrown into the circulation either directly or by way of the lymphatics. If the primary infection is in the zone of the systemic circulation these bacteria either lodge in the lungs, or may succeed in filtering through the pulmonary capillaries and re-enter the general circulation, producing in the former instance miliary lung abscesses and in the latter abscess of the kidney, spleen, bones and joints, or brain. If the primary infection is in the lung, however, such bacterial emboli pass directly from the pulmonary veins to the left auricle and thence into the general circulation. The resulting lesions are known as metastatic abscesses or infections.

Nine instances of such peripheral metastatic suppurative lesions originating from a primary intrathoracic focus have been observed in the surgical wards of the Mount Sinai Hospital since 1918. The pulmonary lesions were pneumonitis, empyema both recent and old, lung abscess, and bronchiectasis. The metastatic infections occurred in the soft parts, the joints, the epiphyses and the flat bones. In only one case was bacteremia demonstrated. In only one instance did the metastatic lesion assume the foul character of anaerobic infection so frequent in lung suppuration.

When dealing with brain abscess secondary to pulmonary infections the distinction between embolic and metastatic cerebral suppuration is difficult to maintain not only clinically, but also pathologically. The clinical manifestations of brain abscess are well known and will not be detailed here. Of seven cases suspected only three could be subjected to craniotomy and in two the abscess was found. An observation of clinical importance was made from the review of our cases; namely, embolic phenomena occur especially in those patients who have hemoptysis or post-operative hemorrhage from the lung after pneumotomy for drainage.

A review of the post-mortem records since 1918 was made and the results may be tabulated as follows:

Eighteen complete examinations, including the brain—

Pulmonary Lesion.	Pulmonary Vein Lesion.	Embolic or Metastatic Lesions.
1. Lobar pneumonia.	None.	Purulent encephalitis.
1. Broncho-pneumonia and empyema.	None.	Abscesses of kidney.
1. Broncho-pneumonia and empyema.	None.	Meningitis.
15. Pulmonary suppuration.	2 Thrombosis.	6 Brain abscess.
	1 Phlebitis.	1 Infarct of kidney.
	1 Arterio-venous aneurism.	1 Abscesses of both kidneys.
		1 Gluteal abscess.
		1 Sacroiliac joint suppuration.

In forty-three complete examinations except for the brain the following secondary lesions were noted: Infarction of spleen, 2;

abscesses of kidney, 2; multiple joint infection, 1; peritonitis, 1. In four cases pulmonary vessel lesions were demonstrated: purulent thrombophlebitis, 2; eroded veins in wall of abscess, 1; thrombosis of small artery with infarction at site of exploratory puncture, 1 (sudden death).

In forty-two cases only the thoracic viscera were obtained. In four of these thrombosis in pulmonary vein radicles was found. Thus in ninety-eight cases pulmonary vascular lesions were found in twelve instances. A more detailed examination with reference to this point would probably yield a still larger incidence.

The occurrence of convulsions, collapse, and even death, upon exploratory puncture of the chest, or irrigation of an empyema cavity formerly ascribed to "pleural shock," are now known to be cases of cerebral air embolism. A number of such instances have been observed in our cases. In one case a woman, upon whom bronchostomy for post-tonsillectomy lung abscess had been performed three years previously, was explored for hemorrhage from the fistulous tract. She ceased breathing suddenly ten minutes after the operation was begun. At autopsy air was found in the heart and in the vessels of the brain.

Conclusions: The peripheral complications of pulmonary infections may be embolic or metastatic. The embolic complications may be aseptic or septic, and are referable to thrombotic and phlebitic lesions of the pulmonary veins. They may involve not only the brain but arteries of the extremities, kidneys, and spleen. In empyema cases embolic phenomena should be referred to the underlying pulmonary disease and not to the empyema *per se*. Metastatic infections of soft parts, joints, epiphyses and flat bones occur in pleural and pulmonary infections, more frequently in empyema and lung suppuration than in simple pneumonitis.

Section of Neurology and Psychiatry, March 8, 1927

ON ASSOCIATED MOVEMENTS AS FOUND IN INVERTEBRATES AND VERTEBRATES INCLUDING MAN—A STUDY IN THE COMPARATIVE PHYSIOLOGY OF POSTURE

WALTER M. KRAUS

A— 1. Every "associated movement" in the present accepted sense of these words has as its cause a primary muscular movement. "Associated movements" are therefore secondary to this primary muscular movement.

2. The reflex arc for every "associated movement" carries stimuli arising in muscles on the afferent side, and stimuli passing to muscles on the efferent side.

3. The secondary movement or response is a postural response, that is, one which alters posture, and is limited to somatic musculature; I propose therefore to call "associated movements" *Postural Somatic Reflexes.* It is unnecessary to include the word muscular.

4. Thinking now of all groups of postural somatic reflexes, *i.e.*, any reflex which alters posture, we note that the stimulating impulse may arise either in muscles (example—voluntary contraction for eliciting associated movements), skin (example—pin prick), subcutaneous tissues (example—pressure), tendons or periosteal surfaces (example—tapping with a hammer).

5. The afferent parts of these arcs which excite postural somatic reflexes may be classified as myaesthetic and non-myaesthetic. It becomes apparent that all tendon reflexes such as the knee-jerk, and indeed all reflexes involving response in muscles, must have a stimulus which is either myaesthetic or non-myaesthetic.

6. Turning now to the responses to the above mentioned two groups of stimuli, we find that there may be somatic muscular responses, visceral or smooth muscular responses and visceral glandular responses. It

is only with the first that we are concerned at present.

7. The simplest postural response is that accompanying the stretch reflex of Sherrington and Lydell; in this the muscle contracts in response to its own stretching by mechanical means. This in its simplest form is the unimuscular somatic postural reflex.

8. When tendon reflexes, periosteal reflexes, skin reflexes, such as radial periosteal and abdominal reflexes, are considered, we find that the muscles involved in the response are one or several. This is the second large category of somatic postural reflexes.

9. The next most complicated somatic postural reflexes are those involving axial musculature or that of a single limb. The flexion reflex of the leg, as well as the muscular responses of "associated movements," are among these.

10. The classification of postural patterns due to integration of neurone activity, previously described by the author, indicate the progressive combination of more and more complicated pictures of combined postures, until we reach that very complicated combination of simple postures manifested in human erectness. Thus there is demonstrable in man a sequence, from the most simple to the most complicated postural patterns.

11. Automatic acts such as running, swimming, jumping, crawling, etc., are somatic postural reflexes of complicated character. In disease, as, for example, hemiplegia and Parkinsonism, the arcs for these reflexes may be disordered (example—gait, propulsion).

12. All of the "associated movements" and automatic acts and postural responses, such as the signs of Kernig, Brudinzki, Marie and Foix, Hoover, etc., may easily be placed in this classification of postural patterns and their combinations.

B— 1. The second part of the paper is devoted to an inquiry into the phylogeny of posture. Many difficulties of the subject were emphasized. The occurrence of the simplest patterns in the most ancient types of animals is illustrated by the powerfully-closed shell of the

oyster and clam in response to an attempt to open the shell (stretching).

2. A table was presented which suggested how the appearance of certain postural patterns in various animal groups from fish to man may be correlated with geological periods.
3. Postural somatic reflexes are one indication of the behavioristic possibilities of animals, and furthermore of the effect of the environment filtering through the particular nervous system which they may possess. Much may be gained from a comparative evolutionary study of postural somatic reflexes, since this will throw light upon the evolution of behavior.

Section of Neurology and Psychiatry, March 8, 1927

SOME OBSERVATIONS ON THE DEVELOPMENT OF HUMAN MOTILITY AND ON MOTOR DISTURBANCES

G. SCHALTENBRAND

In order to study pathological movement and position reflexes in man it is necessary to know his normal movement and position reflexes. These normal phenomena were investigated in a series of over 120 children of all ages, according to the methods used by the school of Magnus and de Kleyn for their examination in animals.

In the new-born baby the neck-righting reflex is present; the labyrinthine-righting reflex and the body-righting reflex on the body are still incomplete. A certain number of babies have Magnus-de Kleyn reflexes in the arms. Human babies have during the first three months of life a peculiar extension reflex of the extremities to all kinds of sudden stimuli, such as loud noises, passive movements of the limbs, and especially passive movements in space. This is the so-called *Moro reflex*. In the second half of the first year babies have all the righting reflexes of quadrupedal animals, and they progress on all fours. Their neck-

righting reflex is positive. They sit up from the recumbent position by rotating around their body axis. In the second year of life they learn to stand on their legs, and this acquisition starts a gradual change of the whole motility which is completed at the age of about five years.

All the righting reflexes can be inhibited voluntarily, much more than in animals. The neck-righting reflexes and the Magnus-de Kleyn reflexes disappear. Children, as well as healthy adults, are able to stand up from the recumbent position by symmetrically lifting their bodies off the floor.

In pathological conditions of the righting reflexes, two definite syndromes can be distinguished: the decerebrate syndrome and the quadrupedal syndrome.

The *decerebrate syndrome* consists in increase of muscle tone, predilection of tone for the antigravity muscles, Magnus-de Kleyn reflexes (tonic neck reflexes) on the extremities, absent labyrinth and body-righting reflexes on the body; while the neck-righting reflexes may be present, and also a positive stretch reaction of the extremities to sudden stimuli such as noises, passive movements of the head or of the joints (Moro reflex). This Moro reflex may be very striking.

This syndrome is frequently found in tumors of the brain or ventricular hemorrhages which compress the midbrain. It may be partially present after all cerebral lesions of the pyramidal tracts (some examples are shown).

The *quadrupedal syndrome* consists in a return of the primitive form of standing up from the recumbent position by rotating around the spine, in a positive neck-righting reflex and in an instability of station which leads the patient to prefer a position on all fours. (This syndrome can be diagnosed only when the ventral muscle chains of the body are intact. It may be imitated by muscle dystrophy or severe muscle weakness of other origin.) The syndrome can be connected with a *lack of inhibition of the righting reflexes,* so that the patient is unable to remain quietly in the recumbent position.

It was found during epileptic attacks, in some cases of glioma of the temporal lobe, in an idiotic child, in cases with double athetosis, and in a child with a cerebellar tumor which had caused a large hydrocephalus.

Cerebellar lesions, however, do not produce this syndrome, as a rule. Cerebellar patients are able to sit up symmetrically, but they show a peculiar asynergy of this movement, described by Babinski, which consists in a throwing upward of the legs.

(Examples are shown both for the quadrupedal syndrome and for cerebellar asynergy.)

Section of Medicine, March 15, 1927

THE PERENNIAL TREATMENT OF SEASONAL HAY FEVER

AARON BROWN

In pollen hay fever, a diagnosis is made qualitatively as to the causal pollen factor or factors, and quantitatively as to the degree of sensitivity, the latter by the method of Cooke.

The pollen extracts used are prepared with Coca's alkaline extracting fluid and are standardized by their nitrogen content. By the intradermal method of skin testing, the pollen cases are put into various classes. The injections, amount, interval, and maximum dosage reached, depend upon the classification. The more sensitive the patient the less is the amount of the extract necessary to protect him.

Treatment is either pre-seasonal or seasonal. In the former treatment is begun two or three months prior to date of expected onset, injections being given at from five to seven-day intervals, to reach the maximum dosage in its class just before the hay fever season begins; in the latter, an effort is made rapidly to bring up the patient's immunity by injections being given daily or every other day. Injections are continued throughout the season.

At the present time treatment stops with the end of the pollen season, to be resumed again the following year. Whatever immunity has been built up in the patient is lost to a degree that has not heretofore been determined, making it necessary to start the treatment, each year, as though the case were a new one.

It is proposed now to treat these pollen cases throughout the year.

In undertaking this, there were two vital questions that had to be solved. The first was, whether the interval between injections could be extended long enough to make the method more convenient than the present one. The second was, whether the clinical protection obtained was as good as that obtained by the previous method.

The investigation of the first question was carried out by simply continuing the treatment at the end of the pollen season and lengthening the interval between injections, first to ten days, then two weeks, three weeks, four weeks, or even longer.

One difficulty that presented itself in applying the new plan was the possibility of a constitutional reaction upon changing from an old, somewhat deteriorated extract, to a new and therefore more active one. This difficulty has been overcome in several ways. Firstly, the method of preparing the extracts has been improved. Secondly, precautions are taken to keep the extracts properly iced. Thirdly, in changing from the old to the new extract, either give the dose in two injections at an interval of thirty minutes, or give a mixture of the old and the new extract.

The number of constitutional reactions was less than that usually obtained in the ordinary pre-seasonal treatment.

With the limited number of cases reported the therapeutic results were very much better than with the previous method.

The annual plan of treatment does not eliminate the necessity of an annual determination of the degree of constitutional sensitiveness, because this sensitiveness has been found by Cooke and his associates to change in some individuals, and Levine and Coca have confirmed this in their quantitative study of the atopic reagins in hay fever subjects after treatment.

The precautions that have to be taken in applying the annual treatment are first, the careful observation of each case, while the interval between injections is being lengthened, and second, the cautious changing from an old extract to a new one.

The special advantages of the annual treatment are obvious. They are:

1. That the treatment may be instituted at any period of the year.

2. That the actual number of visits to the office or clinic can be lessened from the usual twenty or more to twelve.

3. There is less likelihood of an interruption of the treatment by absence, or illness from other causes.

4. It distributes the load of the physician's work in clinic and private practice throughout the year.

Section of Genito-Urinary Surgery, March 16, 1927

UNILATERAL RENAL APLASIA

David W. MacKenzie, Montreal
Allan B. Hawthorne, Montreal
(Department of Urology, Royal Victoria Hospital, Montreal.)

A short series of six clinical cases of imperfect development of the kidney. This condition was unilateral and not associated with any congenital anomalies. One case was of complete absence of the left kidney, with absence of left trigonal ridge and ureteral orifice, the right kidney being hypertrophied.

Three cases showed rudimentary ureters on one side patent for some distance but ending blindly above. In these cases nodules of connective tissue containing remnants of renal tissue were found. In two cases there were thin-walled cysts.

These three cases had definite pain related to the side of the aplasia which was relieved by the removal of the rudimentary cysts and nodules. Two other cases showed marked hypoplasia of the kidney. All cases involved were functionless on the side of the aplasia.

The last five cases were operated upon and microscopical section confirmed the gross findings.

Section of Ophthalmology, March 21, 1927

A DISCUSSION OF SOME OF THE MORE COMMON OPHTHALMIC OPERATIONS

F. H. VERHOEFF, Boston

After making some remarks upon the subject of ophthalmic operations in general, the speaker described some of the procedures that had impressed him as especially valuable during his operative experience of twenty-seven years. In connection with strabismus operations he pointed out that there should always be taken into consideration the facts that tenotomy causes exophthalmos and limitation of motion, while advancement of a muscle causes enophthalmos and astigmatism. He now believes that a partial tenotomy is never indicated—if a tenotomy is required at all it should be complete and its effect limited by a suture if necessary. The advancement operation he still prefers is the one he devised when a medical student. The so-called resection operations and tucking operations are inferior to it in important respects.

The operative treatment of acute and chronic dacryocystitis was discussed. In acute cases he employs the Agnew incision. In chronic cases with fistula, he enlarges the fistula, packs the sac with cotton and then extirpates.

Enucleation of the eye he always performs under local anesthesia, except in cases of young children. The needle is inserted into the orbit through the upper lid in three places. He always implants a glass ball except in cases of old people. Only one suture is employed, by means of which Tenon's capsule is overlapped in four layers in front of the ball. The ocular tendons are not included in the suture. An artificial eye is inserted and a pressure bandage applied.

In cases of contracted socket, the cavity is distended by means of a glass ball under a pressure bandage, and later shaped by means of an artificial reform eye held in place by a pressure bandage. Skin grafting should be employed only as a last resort.

For ptosis, he prefers Reese's operation when the levator is entirely inactive. Otherwise he prefers resection of half the tarsus combined with advancement of the levator.

In cases of trichiasis resulting from trachoma, extirpation of the tarsus usually relieves the condition. In especially bad cases, scalping of the lid margin is the best procedure.

For exposure keratitis with infection, following Gasserian ganglion operations, he has found a conjunctival flap remarkably effective. It is allowed to remain indefinitely, or until the lacrymal secretion returns, when it is easily removed with a spatula, leaving a clear cornea.

For acute glaucoma, he does a Reese iridectomy unless the anterior chamber is too shallow, in which case he makes the incision with a narrow Graefe knife and leaves a conjunctival bridge. For chronic glaucoma, he employs a modified iridotasis. A button-hole is made in the iris midway between the pupil and the limbus, the iris is grasped at the upper margin of the hole and pulled out beneath the conjunctival flap. In this way the sphincter is allowed to remain within the eye so that the pupil is displaced slightly if at all. This is also the best operation for buphthalmos.

The speaker then described his method of performing iridectomy in operations for cataract. In conclusion he briefly described a new method he had recently devised for removing cataracts with their capsule and for suturing wounds of cataract operations.

Section of Obstetrics and Gynecology, March 22, 1927

THE USE OF MERCUROCHROME AS A VAGINAL ANTISEPTIC BEFORE THE INDUCTION OF LABOR, BASED ON THE ANALYSIS OF 171 CASES

H. W. Mayes

During the past ten years there were 9,580 deliveries at the Methodist Episcopal Hospital with 171 bag inductions of labor.

From 1917 to 1924 there were 93 inductions with a gross morbidity of 29 per cent. and eight maternal deaths.

For two and a half years mercurochrome has been used in the preparation of the perineum and as a vaginal antiseptic

before all deliveries, and 3,500 cases with this technique have had a morbidity of 8.6 per cent. Seventy-eight inductions of labor following the use of mercurochrome have had a morbidity of 11.5 per cent., and one maternal death due to hemorrhage.

One thousand six hundred sixty-two deliveries before the use of mercurochrome had an average morbidity of 12.7 per cent.

The morbidity of 14 inductions on primpara before the use of mercurochrome was 50 per cent. with one death. Following the use of mercurochrome, there were twenty-nine inductions with no deaths and a morbidty of 13.7 per cent.

Sixty-three cases were induced for toxemia. Twenty-nine were in the mercurochrome series with a morbidity of 10.3 per cent. with no deaths, while those without mercurochrome had a morbidity of 20.5 per cent. and three maternal deaths.

Without mercurochrome the morbidity increased steadily with the time the bag was in the uterus. With mercurochrome the reverse was true; the longer the bag was in the uterus, the less the morbidity.

A rectal tube was used in addition to the bag in nineteen cases, but the length of labor was not shortened.

Sixty-nine of the infants were premature. There were forty-two still-births and sixteen of the babies died following delivery, while one hundred and thirteen were discharged in good health.

PUBLIC HEALTH RELATIONS COMMITTEE

Dinner to Sir George Newman

The brief visit of Sir George Newman in this country was made the occasion for an expression of personal respect and of recognition for his valuable service as Chief Medical Officer of the Ministry of Health and of the Board of Education of England. On the evening of May 21, the Committee on Public Health Relations of the New York Academy of Medicine tendered a dinner to Sir George Newman, who is an Honorary Fellow of the Academy. Those present at the dinner were:

Drs. W. P. Anderton
George Baehr
Fenwick Beekman
Arthur Bingham
John W. Brannan
James B. Clemens
E. H. L. Corwin
Charles L. Dana
H. S. Dunning
Haven Emerson
Lewis F. Frissell
S. S. Goldwater
Louis I. Harris
Drs. John A. Hartwell
Alfred F. Hess
Charles G. Heyd
Samuel W. Lambert
C. H. Lavinder
Sir George Newman
William H. Park
Bernard Sachs
Frederic E. Sondern
J. Bentley Squier
George David Stewart
Nathan B. Van Etten

Sir George spoke very eloquently on a number of interesting subjects, ranging from the need of better appreciation of beauty to the high quality of the Civil Service employees in the British Government, and to the successful working out of health insurance and factory inspection, which still have very many obvious deficiencies that are being gradually eliminated in practical application. Sir George paid tribute to the advances in public health administration made in this country, and he mentioned particularly the immunization against diphtheria and scarlet fever, which has made such headway in this country because of the cooperation of the public, a condition which does not prevail in England. He also spoke of the superiority of our control of the milk supply. He finished his address with the plea for "little books," pointing out that the great masterpieces in medical literature have been comprised within a small compass.

Short addresses of welcome were made by Dr. Samuel W. Lambert, President of the Academy, Dr. Charles L. Dana, Chairman of the Committee on Public Health Relations, Dr. Haven Emerson, and by Dr. Louis I. Harris in the name of the Health Department. Dr. George David Stewart was the toastmaster.

Recommendations Relative to the Contagious Disease Hospitals of the Department of Health of the City of New York

1. Efforts should be made by the Department of Health to impress the general practitioner with the paramount importance of early hospitalization of patients suffering from communicable diseases, when the home environment of the patient is such that he is not likely to obtain the proper type of care.

2. It is imperative that a cooperative arrangement be worked out between the hospitals of the Department of Health and the physicians of the community by which the active interest of the physicians would be maintained in the cases referred by them to the hospitals.

3. It is suggested that the Health Commissioner consider the desirability of vesting in the medical boards of contagious disease hospitals authority to summon for conference physicians who have failed to give the best possible service to their patients before their removal to the hospital. This should apply particularly to physicians whose patients die within forty-eight hours after admission to the hospitals.

4. Contagious disease hospitals should become the training centers for the diagnosticians of the Department of Health, as well as for the entire corps of medical inspectors of the Department. Such an arrangement, whereby every new medical officer of the Department would receive training for several months in the hospital, prior to his assignment to field duty, would be beneficial for the professional competence of the medical inspectors and would assure to the hospitals an auxiliary staff. Similarly, experience in a contagious disease hospital or equivalent training should be made a prerequisite for every new nurse on the staff of the Department of Health.

5. The Committee heartily endorses the arrangements which have been made by the Department of Health with the medical schools in the city, whereby nominations for positions on the visiting and assistant visiting staff of the Willard Parker Hospital are made in rotation by the deans of the cooperating medical schools to the Commissioner of Health. The Committee believes

that this plan should be extended to all of the hospitals of the Department, and expresses its belief that such an arrangement could be worked out in an advantageous and practical way.

6. The Committee desires to reiterate its recommendation made some time ago, that all of the hospitals in the city should avail themselves of the opportunities offered by the hospitals of the Department of Health, to train for a period of time such of their interns who have not had an adequate opportunity to learn how to recognize and treat certain types of communicable disease.

7. The Committee suggests that the attention of authorities of general hospitals be officially called to the opportunities for technically high-grade training in nursing care of contagious diseases at the Willard Parker and other Health Department hospitals, with a view of making a short period of this training a prerequisite to graduation from Nurse Training Schools.

8. Every effort should be made at the hospitals of the Department of Health to safeguard the patients against secondary (cross) infections and complications by rigid enforcement of every known method of aseptic technic and by maintaining adequate nursing standards.

9. All facilities for scientific research should be provided for the medical staff of the hospitals in the Department of Health.

10. Adequate clinical record-keeping should be enforced in all of the hospitals of the Department, and this should be a responsibility of the respective medical boards, as well as of the medical directors of the hospitals.

11. The statistical control service should be centralized and made uniform for all of the hospitals of the Department of Health, under the Director of the Bureau of Hospitals.

12. An adequate Social Service staff should be made available to every hospital of the Health Department.

13. The approved plans for additional construction and renovation of some of the present buildings should be executed as expeditiously as possible, in so far as funds are available.

14. A contagious disease unit should be established on the grounds of Seaview Hospital to serve the needs of Staten Island.

15. The Committee recommends the testing out of a plan for a better utilization of the hospitals of the Department of Health by admitting during the summer and autumn months certain

types of communicable disease, such as erysipelas, typhoid fever, venereal diseases, encephalitis lethargica, poliomyelitis, and cerebrospinal meningitis. It is also recommended that the Director of Hospitals consider the possibility of using a vacant hospital pavilion during summer months for tonsil and adenoid operative service for children of pre-school and school age.

16. The frequently-occurring long delays in transporting patients to the hospitals should be obviated by equipping each of the hospitals with an adequate number of ambulances. This would, likewise, render unnecessary the occasional practice of bringing more than one infected patient in the ambulance at the same time. The attention of the Director of Hospitals is called to the disadvantage of having interns presumably on ward duty drafted for long periods of time every other day for ambulance duty.

17. The Health Department regulations for isolation facilities in institutions should be enforced in order to avoid the present abuse which results from the anxiety of the hospitals to remove contagious disease patients to Health Department hospitals, in many instances at the time in the progress of the disease when such a removal jeopardizes the recovery of the patient.

18. The Committee recommends that the city provide convalescent service for the patients discharged from the Contagious Disease Hospitals. The property which the city has long owned on Eastchester Road, in the Bronx, could be utilized to build convalescent homes for the patients of the Manhattan and the Bronx; and the grounds of the Queensboro Hospital could be utilized for building a convalescent home for patients from the other boroughs of the city.

LIBRARY NOTES

RICHARD BRIGHT EXHIBIT

This is the centenary of the publication of Bright's *Reports of Medical Cases*, so an exhibit illustrating his career has been arranged in the Library. The following is a list of what has been shown.

Works of Richard Bright (1789–1858)

Travels from Vienna through lower Hungary; with some remarks on the state of Vienna during the Congress in the year 1914. Edinburgh, A. Constable & Co., 1818.

(Open at the title-page. Plates from sketches made by the author. Kindly lent by Dr. A. M. Hellman.)

Reports of medical cases, selected with a view of illustrating the symptoms and cure of diseases by a reference to morbid anatomy. London, Longman . . . 1824–31. 2 vols. in 3.
(Vol. I open at cases of granulated kidneys "connected with the secretion of coagulable urine," p. 9. [Bright's disease] Vol. II open at the title-page.)

Analysis of a specimen of cutaneous perspiration by J. Bostock, M.D., F.R.S., with an account of the case by Richard Bright, M.D., F.R.S.
(*Medico-chirurgical Transactions*, 1828, vol. 14, p. 424.)

Cases and observations connected with disease of the pancreas and duodenum.
(*Medico-chirurgical Transactions*, 1833, vol. 18, p. 1.)

Cases and observations illustrative of diagnosis when adhesions have taken place in the peritoneum, with remarks upon some other morbid changes of that membrane.
(*Medico-chirurgical Transactions*, 1835, vol. 19, p. 176.)

Account of a remarkable displacement of the stomach.
(*Guy's Hospital Reports*, 1836, vol. 1, p. 600. Illustration of case drawn by C. J. Canton.)

Gulstonian lectures, 1833, on the function of the abdomen, and some of the diagnostic marks of its disease.
(*London Medical Gazette*, 1833, vol. 12, p. 281.)

Cases of spasmodic disease accompanying affections of the pericardium.
(*Medico-chirurgical Transactions*, 1839, vol. 22, p. 1.)

Observations on abdominal tumors and intumescence.
(*Guy's Hospital Reports*, 1837, vol. 2, p. 432; 838; vol. 3, p. 179.)

Clinical memoirs on abdominal tumors and intumescence. Reprinted from the "Guy's Hospital Reports." Edited by G. Hilaro Barlow, M.D., M.A., Cantab., . . .
(London, New Sydenham Soc., 1860.)

Account of observations made under the superintendence of Dr. Bright on patients whose urine was albuminous. By G. H. Barlow, M.A., M.D. . . .
(*Guy's Hospital Reports*, 1843, 2nd ser., vol. 1, p. 189.)

Die Erkrankungen der Niere (1827 und 1836). In "Deutscher übersetzungen" . . . von Erich Ebstein. Leipzig, Barth, 1916. (Klassiker der medizin, no. 25.)

Written in Collaboration with Thomas Addison (1793–1860)

Elements of the practice of medicine.
(London, Longmans . . . 1839, only vol. 1 published.)

The Older View on Dropsy

Modern practice of Physic . . . by Robert Thomas, 8 ed., New York, Collins & Collins, 1825.
(Open at p. 567 to show view on dropsy of Bright's contemporaries.)

Obituaries, etc.

Obituary. Dr. Richard Bright. The *Lancet*, 1858, II, p. 665.

Richard Bright, sa vie et ses oeuvres. By Charles Lasègue.
(*Archives génèrales de médecine*, 1859, vol. I, p. 257.)

Richard Bright's travels in lower Hungary; a physician's holiday. By F. H. Garrison.
(*Johns Hopkins Hospital Bulletin*, 1912, vol. 23, p. 173.)
(Open at p. 180, showing portraits of Bright and his father.)

Richard Bright and his discovery of the disease bearing his name. By Sir William Hale-White.
(*Guy's Hospital Reports*, 1921, vol. 71, p. 1. Open at p. 6 showing ward in Guy's Hospital where Bright made his observations; and colored plate reproduced from Brights "Medical Cases.")

The centenary of the discovery of Bright's disease. By Sir William Hale-White. The *Lancet*, 1925, II, p. 769.
(Sir William thinks that the centenary should have celebrated the anniversary of the first study of the disease [1825] rather than the publication [1827].)

Portraits, etc.

Richard Bright, M.D., F.R.S. By T. J. Pettigrew.
(In Pettigrew's Medical Portrait Gallery. Sketch and portrait [engraving].)

Richard Bright on September 13, 1813.
(*Brit. M. J.*, 1913, II, p. 683. Open at p. 685, showing title-page of Bright's inaugural thesis: "De Erysipelate Contagioso.")

Medical education in London.
(London, Ash & Co., 1908. Open at p. 54, showing view of Guy's Hospital, where Bright's observations were made, and a portrait of Bright.)

Portraits of Associates of Bright

Benjamin Travers (from Pettigrew).
Thomas Addison (from *Münch. Med. Woch.*).
Sir Astley Cooper (from Fanning's Gallery . . .).

RECENT ACCESSIONS TO THE LIBRARY

American Medical Association. Council on Pharmacy and Chemistry. New and nonofficial remedies.
Chicago, A. M. A., 1927, 473 p.

American Medical Directory. 10 ed. 1927.
Chicago, A. M. A., 1927, 2574 p.

Anderson, W. K. Malarial psychoses and neuroses.
London, Oxford Univ. Pr., 1927, 395 p.

Bing, R. Compendium of regional diagnosis in affections of the brain and spinal cord. 3 ed.
London, Heinemann, 1927, 204 p.

Biographical sketches and letters of T. Mitchell Prudden, M.D.
New Haven, Yale Univ. Pr., 1927, 311 p.

Borchewsky, B. Pathologie et méthodes d'examen du liquide céphalorachidien.
Paris, Masson, 1926, 56 p.

Breckenbridge, S. P. Public welfare administration in the United States.
Chicago, Univ. of Chicago Pr. [1927], 786 p.

Brogsitter, Ad. M. Histopathologie der Gelenk-Gicht.
Leipzig, Vogel, 1927, 122 p.

Brooks, G. E. Aids to tropical medicine. 3. ed.
London, Baillière, 1927, 228 p.

Bulletin no. ix of the international association of medical museums. Sir William Osler memorial number. 2. impr.
Montreal, privately issued [1927], 634 p.

Butler, T. H. An illustrated guide to the slit-lamp.
London, Oxford Univ. Pr. [1927], 144 p.

Chapman, C. W. The heart and its diseases.
Edinburgh, Livingstone, 1927, 216 p.

Colloid chemistry . . . by selected international contributors . . . edited by Jerome Alexander.
New York, Chemical Catalog Co., 1926. v. 1.

Compton, A. H. X-rays and electrons.
New York, D. Van Nostrand, 1926, 403 p.

Corrêa de Toledo, F. A. Contribuição ao estudio das tatuagens em medicina legal.
S. Paulo, Secção de Obras d' "O Estado de S. Paulo," 1926, 67 p.

Deutsch, F. & Kauf, E. Heart and athletics.
St. Louis, Mosby, 1927, 187 p.

Dide, M. Introduction à l'étude de la psychogénèse.
Paris, Masson, 1926, 221 p.

Diller, T. Pioneer medicine in western Pennsylvania.
New York, Hoeber, 1927, 230 p.

Dingman, H. W. Insurability: prognosis and selection.
Chicago, Spectator Co., 1927, 706 p.

Faber, K. Lectures on internal medicine.
New York, Hoeber, 1927, 147 p.

von Fellenberg, T. Das Vorkommen, der Kreislauf und der Stoffwechsel des Jods.
München, Bergmann, 1926, 363 p.

Fishbein, M. The new medical follies.
New York, Boni & Liveright, 1927, 235 p.

Fisk, E. L. & Crawford, J. R. How to make the periodic health examination.
New York, Macmillan, 1927, 393 p.

Ford, F. R., Crothers, B. & Putnam, M. C. Birth injuries of the central nervous system.
Baltimore, Williams, 1927, 164 p.

Ford, W. W. A textbook of bacteriology.
Philadelphia, Saunders, 1927, 1069 p.

Franz, R. Die Gonorrhoe des Weibes.
Wien, Springer, 1927, 193 p.

Freire, O. Exames e paraceres medico-legaes.
S. Paulo, Saraiva, 1926, 379 p.

Fuhrmann, F. Die Chemie der Nahrungs- und Genusmittel.
Berlin, Wien, Urban, 1927, 610 p.

Gwinn, C. D. A textbook of orthodontia.
Philadelphia, Lea, 1927, 242 p.

Handbuch der Haut- und Geschlechtskrankheiten . . . Hrsg. von J. Jadassohn . . . v. 13, pt. 2.
Berlin, Springer, 1927, 423 p.

Häuple, K. & Lang, F. J. Die marginale Paradentitis.
Berlin, Meusser, 1927, 404 p.

Health (The) of the child of school age. By various authors.
London, Oxford Univ. Pr., 1927, 204 p.

von Herrenschwand, F. Die pathogenen Mikroorganismen des Auges.
Berlin, Urban, 1927, 310 p.

Illinois state medical society. History of medical practice in Illinois. v. 1.
Chicago, Book Pr., 1927, 713 p.

Knopf, S. A. The medical, social, economic, moral and religious aspects of birth control. 3. ed.
New York, 1926, 66 p.

Kovacs, R. The 1926 tour of the travel study club of American physicians.
New York, 1927, 105 p.

Labbé, M. & Violle, P. L. Métabolisme de l'eau.
Paris, Masson, 1927, 256 p.

Leeson, J. R. Lister as I knew him.
London, Baillière, 1927, 212 p.

Leighton, G. The principles and practice of meat inspection.
Edinburgh & London, W. Hodge, 1927, 465 p.

Levine, M. Practical otology.
Philadelphia, Lea, 1927, 387 p.

Lister and the Lister ward in the Royal infirmary of Glasgow. A centenary contribution.
Glasgow, Jackson, 1927, 132 p.

Loeb, L. B. Kinetic theory of gases. 1. ed.
New York, McGraw-Hill, 1927, 555 p.

Manson-Bahr. The life and work of Sir Patrick Manson.
London, Cassell, 1927, 275 p.

Mattos, W. B. As sarcophagas de S. Paulo.
S. Paulo, Rothschild, 1926, 123 p.

McCombs, C. E. City health administration.
New York, Macmillan, 1927, 524 p.

Muir, R. & Ritchie, J. Manual of bacteriology. 8. ed.
London, Oxford Univ. Pr., 1927, 821 p.

Naegeli, O. Allgemeine Konstitutionslehre.
Berlin, Springer, 1927, 118 p.

Newman, Sir G. An outline of the practice of preventive medicine.
London, H. M. S. O., 1926, 154 p.

Nida, W. & Nida, S. Men of science and their discoveries.
London, Harrap, 1927, 191 p.

Olivecrona, H. Die chirurgische Behandlung der Gehirntumoren.
Berlin, Springer, 1927, 344 p.

Ortner, N. Klinische Symptomatologie innerer Krankheiten. 3 aufl., v. 1, pt. 2.
Berlin, Urban, 1926, 426 p.

Peixoto, A., Favero, F. & Ribeire, L. Medicina legal des accidentes de trabalho.
Rio de Janeiro, Alves, 1926, 360 p.

Pires de Lima, J. A. As anomalias dos membres nos Portugueses.
Pôrto, Araujo, 1927, 177 p.

Practical lectures delivered under the auspices of the medical society of the county of Kings. 2 ser., 1924–1926.
New York, Hoeber, 1927, 590 p.

Reports from the laboratory of the Royal college of physicians, Edinburgh. v. 16.
Edinburgh, Oliver, 1926.

Robinson, W. J. A doctor's views on life.
London, Allen, 1927, 526 p.

Schlesinger, E. Die Röntgendiagnostik der Magen- und Darmkrankheiten. 3 aufl.
Berlin, Urban, 1927, 485 p.

Schmidt, O. A febre amarella na Bahia em 1926.
Bahia, Livr. e. Typ. Do Commercio, 1927, 196 p.

Schuurman, C. J. Der Bakteriophage.
Bonn, Rohrmoser, 1927, 174 p.

Shastid, T. H. An outline history of ophthalmology.
Southbridge, Mass., Amer. Optical Co., 1927, 32 p.

Silver, J. F., Hall, M. W. & Hitchens, A. P. Dengue.
Manila, Bureau of Printing, 1926, 476 p.

Spoehr, H. A. Photosynthesis.
New York, Chem. Cat. Co., 1926, 393 p.

Stern, B. J. Social factors in medical progress.
New York, Columbia Univ. Pr., 1927, 136 p.

Stewart, Sir J. P. Intracranial tumors, and some errors in their diagnosis.
London, Oxford Univ. Pr., 1927, 206 p.

Textbook of medicine. By American authors. Ed. by R. L. Cecil.
Philadelphia, Saunders, 1927, 1500 p.

Transactions of the ophthalmological society of the United Kingdom. v. 46.
London, Churchill, 1927, 410 p.

Vallée, A. Un biologiste Canadien, Michel Sarrazin.
Quebec, 1927, 291 p.

Webster, H. T. The physician and the family.
Cincinnati, 1927, 160 p.

Weixberg, E. Your nervous child.
New York, Boni, 1927, 178 p.

Westphal, K. Über die Entstehung des Schlaganfalles.
Leipzig, Vogel, 1926, 109 p.

Woollacott, F. J. The nursing of infectious diseases.
London, Faber, 1927, 228 p.

Wu Lien-Teh. A treatise on pneumonic plague.
Geneva, League of Nations, 1926, 466 p.

Wyard, S. A handbook of diseases of the stomach.
London, Oxford Univ. Pr., 1927, 387 p.

Yearsley, Macleod. A manual of the electrophonoid method of Zünd-Burguet for the treatment of chronic deafness.
London, Heinemann, 1927, 108 p.

ANNOUNCEMENTS

The *Paris Thèses* have been received in the Library and are now fully catalogued and available for the use of Fellows.

At the stated meeting of May 19, Dr. John A. Hartwell was nominated for the office of Trustee to fill the unexpired term of the late Dr. Walter B. James. Election will take place at the stated meeting of October 6.

There are quite a number of photographs and other portraits of doctors in the collection of the Academy which cannot be identified. The Librarian would be grateful if the Fellows—with good memories for faces—would ask to see them and help in this matter.

HOSACK BED FOR SICK AND NEEDY PHYSICIANS

Attention is directed to the following extract from the will of Mrs. Celine B. Hosack:

"I do give and bequeath unto my executors, hereinafter named, the sum of Ten Thousand Dollars, in trust, to apply and pay the same (or so much thereof as may be necessary) to The Roosevelt Hospital in the city of New York, to purchase a bed which, in memory of my husband, shall be known as the Hosack Bed, and which shall be occupied from time to time by such sick and needy physicians as may for that purpose be named or designated by the President and Treasurer for the time being of The New York Academy of Medicine."

DONATIONS TO THE LIBRARY FUNDS

Donations and bequests are solicited by The New York Academy of Medicine for the maintenance and expansion of the Library.

A donation or bequest of $5,000 or more will provide for a special library fund, the income of which may be used for the general purposes of the Library or restricted to the purchase of books and periodicals, as the donor or testator may indicate.

FORM OF BEQUESTS

The following is a brief legal form as a suggestion under which bequests may be made in behalf of the Academy:

I give, devise and bequeath unto "The New York Academy of Medicine" of the City of New York, State of New York, a corporation duly incorporated by the legislature of the State of New York by an act, entitled "An Act to Incorporate The New York Academy of Medicine," passed June 23, 1851, and amended June 4, 1853, June 2, 1877, and April 24, 1925.

DEATHS OF FELLOWS OF THE ACADEMY

VIRGIL PENDLETON GIBNEY, A.B., A.M., LL.D., M.D., 65 Park Avenue, New York City; graduated in medicine from Bellevue Hospital Medical College in 1871; elected a Fellow of the Academy, March 1, 1877; died, June 16, 1927. Dr. Gibney was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the American Orthopedic Society, and the Pathological Society. He was Surgeon-in-Chief to the Ruptured and Crippled Hospital, Consulting Surgeon to the Neurological Institute, Montefiore Hospital, St. John's Guild, St. Agnes's Hospital, White Plains Hospital, St. Vincent's and Bridgeport Hospitals.

ANTONIO STELLA, A.M., M.D., 214 East 16th Street, New York City; graduated in medicine from the University of Naples, Italy, in 1893; elected a Fellow of the Academy, February 2, 1899; died, July 2, 1927. Dr. Stella was a Fellow of the American Medical Association, a member of the National Tuberculosis Association, and a member of the Tuberculosis Association. He was also Consulting Physician to the Manhattan State and Italian Hospitals, and Visiting Physician to Columbus Hospital.

1927

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